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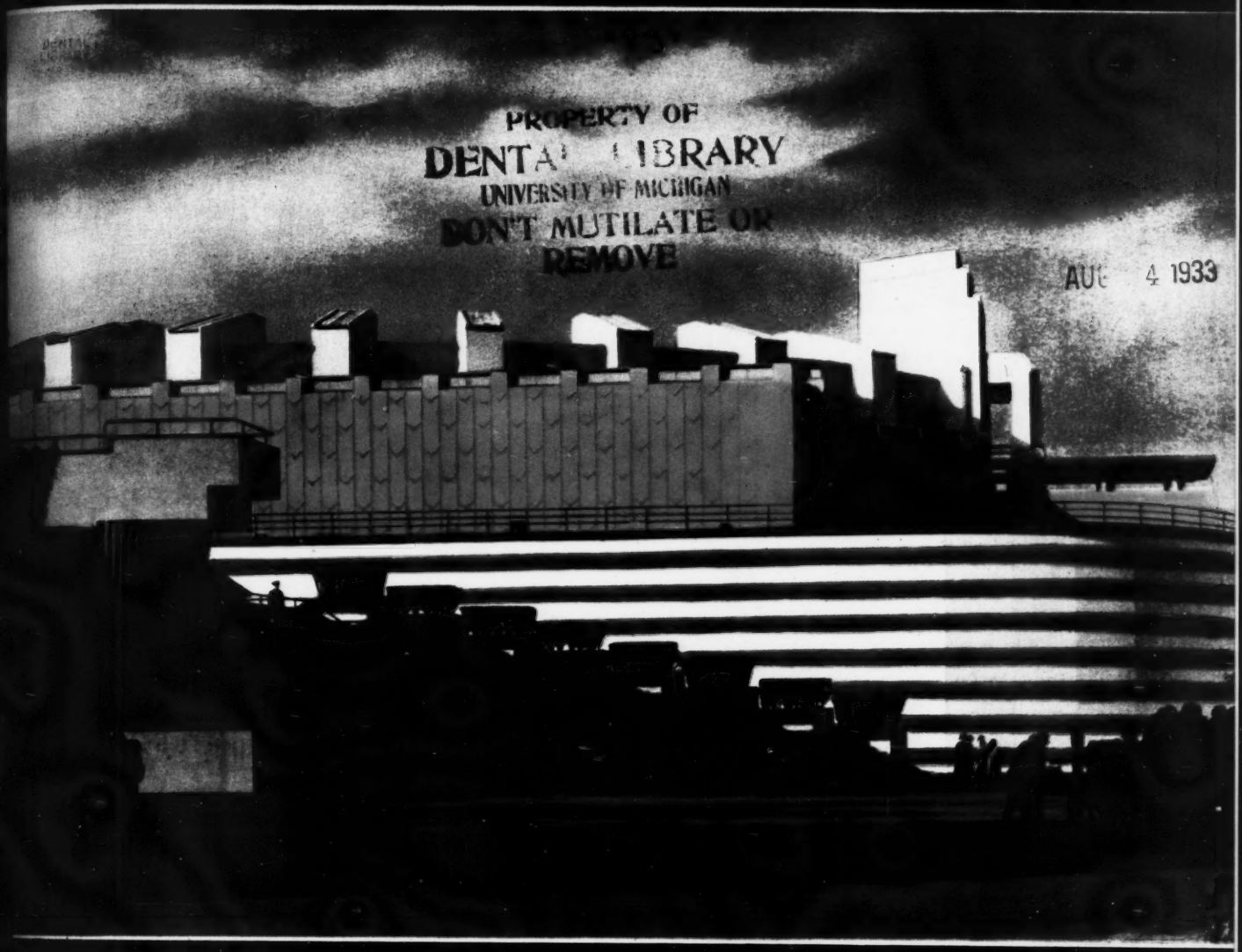


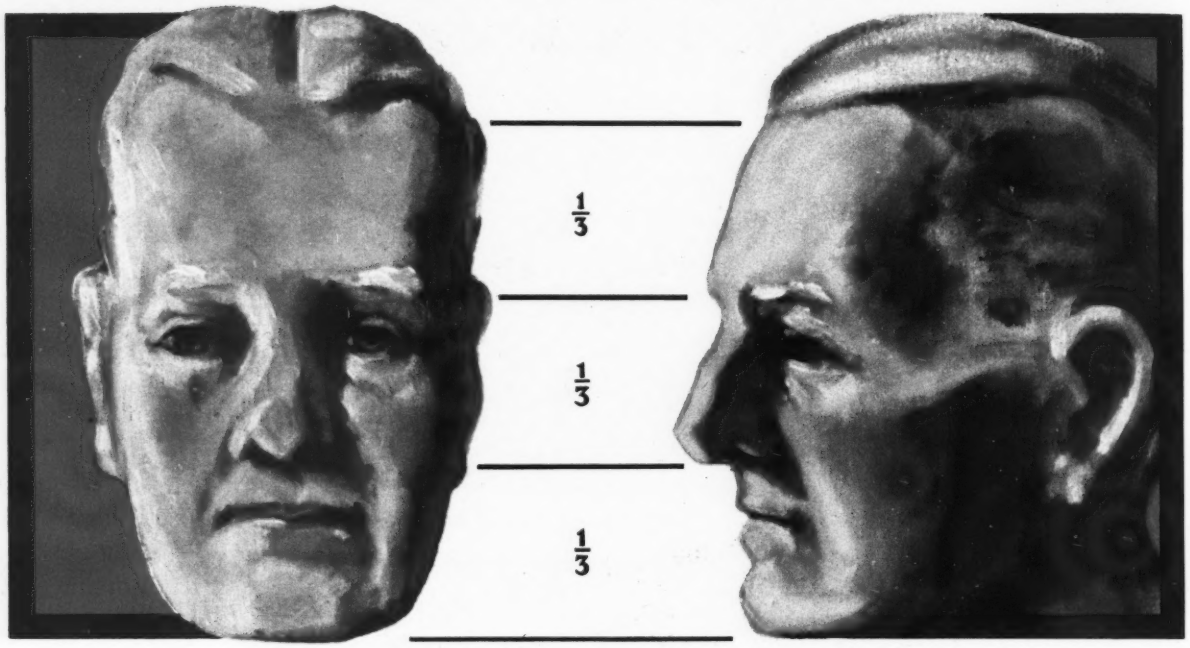
The Court of the Hall of Science
A Century of Progress, Chicago

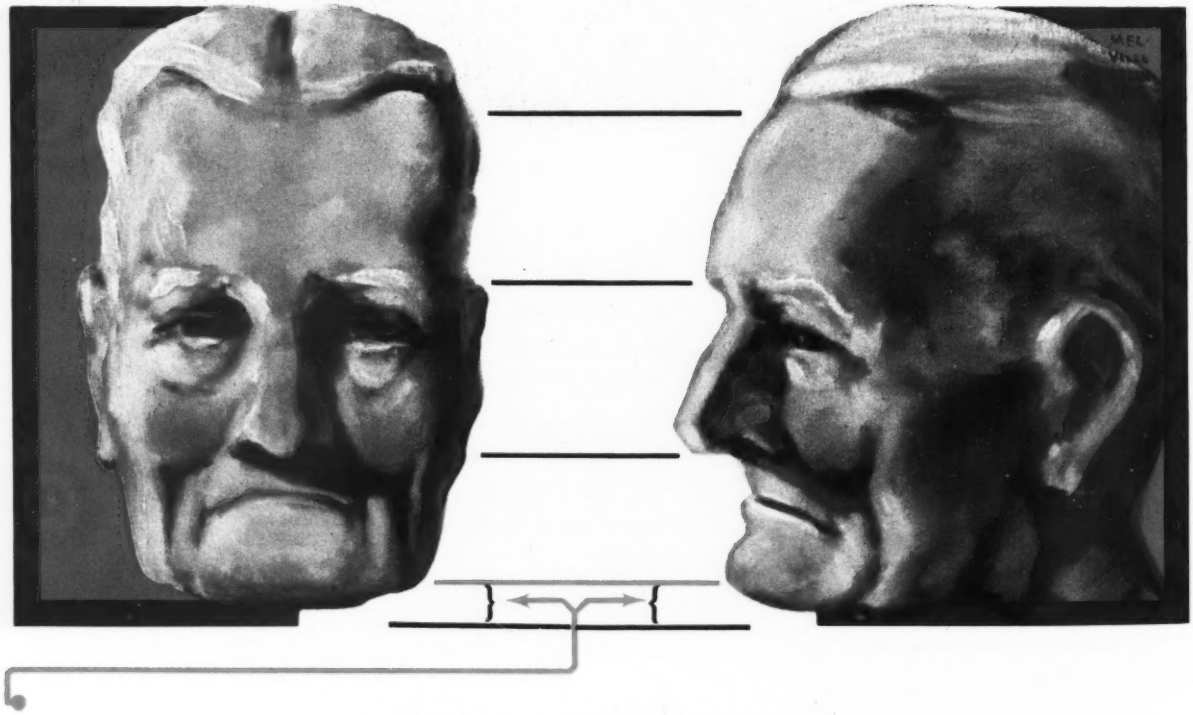
The DENTAL DIGEST

July
1933

THE EDUCATION OF THE DENTAL PATIENT*

V. HOW THE LOSS OF TEETH AFFECTS THE FACE





Upper pictures show the normal face, front and side views.

Lower pictures show the changes in the lower third of the face with loss of vertical dimension producing: (a) narrowing or squinting of the eye; (b) pouting of the cheek; (c) distention of the base of the nose and deep wrinkles at the alae; (d) drooping of the corners of the mouth; (e) outward and downward roll of the lower lip, and (f) flabbiness or chops in the cheeks.

PREVENTION: Guard and preserve the teeth to prevent these facial changes.
TREATMENT: The skillful and artistic construction of scientific dentures.

*This is the fifth chart in the series intended for the use of the dentist in explaining important normal and pathologic dental conditions to his patients.

The DENTAL DIGEST

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POSTOPERATIVE COMPLICATIONS

WILTON W. COGSWELL, D.D.S., F.A.C.D.
Colorado Springs, Colorado

THE subject of postoperative pain from tooth removal and the proper method of its treatment is under constant discussion and allows broad differences of opinion. Various nostrums, offering little but palliative value, are generally used but prove successful only insofar as they obscure the true cause of such an occurrence. Palliative treatments are naturally the only recourse of the healing arts until the cause of a disease is recognized and preventive measures may be instituted.

The adoption of correct surgical procedures preceded by accurate preoperative diagnostic methods may be expected substantially to reduce the demoralizing occurrence of postoperative pain in dental practice. However, success does not necessarily follow the adoption of such a suggestion unless an analysis is made of some of the fundamental causes of surgical failures. Underlying the immediate causes of postoperative complications is often found a psychologic factor that prevents some operators from developing into skillful technicians in surgery. It should not be said that this factor cannot be overcome, but continued failure in this work indicates the need for a close scrutiny of one's mental reactions to surgery.

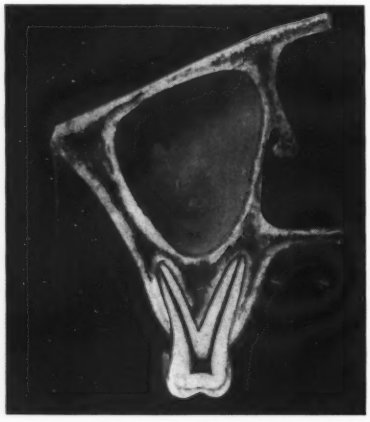

Fig. 1—Cross section through the right maxillary bone and upper right first molar. Because of root divergence this tooth cannot be removed through the normal socket openening by simple forceps methods without the occurrence of root fracture or excessive alveolar process expansion.

Some men have an inherent distaste for all types of surgical procedure and, recognizing the injurious effect that such an attitude unquestionably has on their operative technique, they refrain from undertaking surgical cases. Absence of sufficient training in the principles of surgery, or the study of its allied subjects and the refusal to acknowledge the importance of modern methods in tooth removal, result in postoperative complications. In some instances the desire to present spectacular methods of removal carries the operator beyond the realm of good surgery to the borderline of tissue mutilation.

Not only the lack of sufficient training may be responsible for postoperative complications but also the failure to realize that a thorough comprehension of the work must be had by the members of the assisting staff as well as by the operator himself. Continued success in surgical cases depends on a faultless routine procedure developed to accommodate the mental reactions of the patient, the normal operative steps of the case and any emergency that may arise.

Failures in surgery are often apparent in cases undertaken purely from mercenary motives and especially so when general economic conditions persuade unprepared operators that nothing remunerative should be overlooked. Dentistry is fortunate, however, in being represented by men unsurpassed in their initiative and determination to serve their patients to the best of their ability. If they have in the past concentrated more effort on the restorative phases of dentistry than on analysis of its surgical requirements, there is a marked renewal of interest at the present time which portends improvement in the treatment of surgical cases.

The correct removal of teeth is justly classed as surgery and demands skill of the highest quality. To permit a doubt as to its equality with other types of surgery is to acknowledge ignorance of fact. Failure to equip one's self with the newer methods of procedure deserves criticism. The practice of correct dental oral surgery entails neither great expense nor specialization but it does require study of the subject and altered methods in the average general office.

Until recent years the paramount issue of dental oral surgery was simply tooth removal. Even its entire removal was not always deemed necessary. Now, recognition is given to the importance not only of the elimination of the entire tooth but also of the condition of the remaining tissues. No tooth should be removed without due consideration being given the fact that eventually that mouth may be edentulous. Treatment of the investing tissues at the time the teeth are removed not only determines the immediate comfort of the patient but the subsequent service which these tissues will be able to deliver.

Postoperative pain is, of course, the most disconcerting result of failure to consider the remaining tissues and demands some palliative treatment under such conditions. The term postoperative complication, however, is more expansive in its application for it may indicate impaired future function of the edentulous ridge. The excessively painful recovery from tooth removal indicates a disturbed cycle of normal tissue regeneration which may result in a deformity of these tissues.

While the ingenuity of man has utilized the edentulous dental ridges as a basis for artificial denture support, the fact remains that they were not so intended. Their proper form is dependent on conservation of the es-

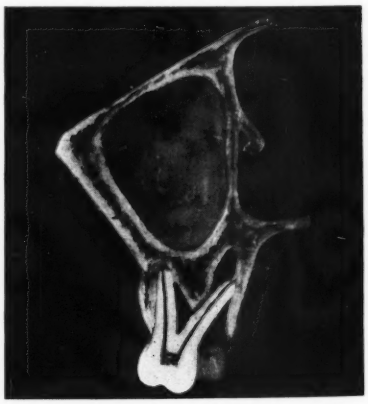

Fig. 2—Buccal process fracture, excessive expansion, and laceration of overlying gum tissue resulting from forceps pressure.

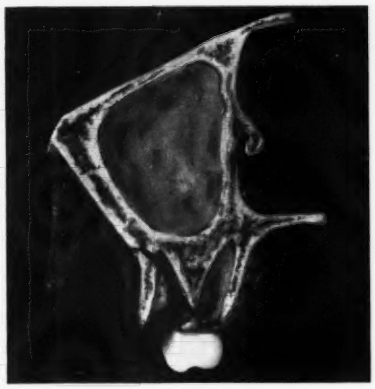

Fig. 3—Extent of alveolar process displacement necessary to permit the removal of the first molar shown in Figs. 1 and 2, unless surgical methods are followed.

sential body of alveolar process by surgical methods and properly constructed restorations; otherwise, the natural sequence of atrophy and anatomic change makes them unfit for the function of efficient denture support. A vast majority of cases resulting in postoperative pain and other complications are the natural sequence of some degree and form of tissue mutilation. Though rather harsh the term "mutilation" is applicable to many forms of tissue treatment which at first glance seem of no great importance.

Tissue Mutilation

Tissue mutilation may appear as the result of either too little or too much surgical intervention or it may be obvious in the traumatized and lacerated tissues which follow obsolete methods of tooth extraction. Under the old methods the tooth was, and in many instances still is, forced bodily from its socket by the application of extreme force. The effect is to produce trauma of the investing bone and an expansion of the buccal alveolar plate by fracture.

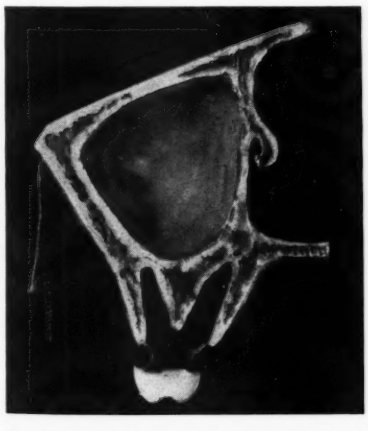

Fig. 4—Correctly followed surgical methods permit conservation of the alveolar walls, reduction of marginal bone irregularities, and the proper readaptation of the gingiva for blood clot retention and bone protection.

Examination of numerous extracted teeth readily discloses the impossibility of their removal from the alveolus without bone displacement to allow passage of roots that are much greater in circumference than the neck of the tooth. This proves true of many teeth having only one root and nearly always of those having two or more. Expansion of the buccal or labial alveolar plates often causes laceration of the overlying gum tissue.

When, as is often the case, the fractured segment of alveolar plate is removed with the tooth, the margins of the lacerated gum tissue collapse into the socket. Such a condition exposes the inner walls of the alveolus to the constant influx of oral secretion and permits traumatic injury by mastication, thus losing normal retention of a protecting blood clot. The margins of the lacerated tissue slough away, affording further exposure of the alveolus with an accompanying loss by degeneration of the periosteal support that is necessary for bone regeneration. This results in what is loosely termed a "dry socket," accompanied by pain and discomfort. The eventual form of this edentulous section of the dental ridge is inferior and usually of the knife-edge variety. If the segment of fractured alveolus remains in its expanded, or extended, position, though the gum tissue is not torn, exposure of the socket walls is to be expected, owing to the inability of the gum margins to overlie the alveolar crest and provide for its protection and the retention of a blood clot. The pressure of forceful tooth removal traumatizes the surrounding bone, thus interfering with the blood supply and normal tissue repair.

A study of osteogenesis discloses the necessity of a subperiosteal support if regeneration of the dental ridge is to be expected. Such support must be provided for in the dental ridge by conservation of the alveolar tissue as a matrix to sustain the periosteum; otherwise, the collapse of this bone covering occurs, limiting the height of the dental ridge to that point wherein the periosteum is healthily supported.

Incisions, made for the purpose of bone exposure so that its resection can be accomplished to permit the removal of the tooth, may result in a similar occurrence of gum collapse, unless due consideration is given the design of the incision and the retention of a bone support for the ultimate replacement of the mucoperiosteal flap thus formed.

Fig. 5—Cross section through the mandible and mesial root of lower right first molar.

It is not intended, by stressing the principle of conservation of the alveolar process, to infer that the bulk of all alveolar process should be left intact. The ideal postoperative condition of the investing tissue of the tooth is one in which the alveolus remains intact except for a surgical resection of its outer portion or wall to allow the tooth to be removed without trauma or fracture and the reduction of prominent or sharp spicules and margins which might prevent correct readaptation of the gingiva. Properly to protect both the alveolar crest and the inner walls of the socket the gum margin must adhere tightly over a well rounded crest and extend slightly inward toward the opposite gum margin. It thus forms a soft tissue flange which retains the blood clot in its protective relation to the bone until the normal disintegration of the clot occurs as a natural sequence.

In many instances an extremely wide socket accompanied by a short or receded gum margin prevents the gum margin from assuming this required position and the alveolar crest

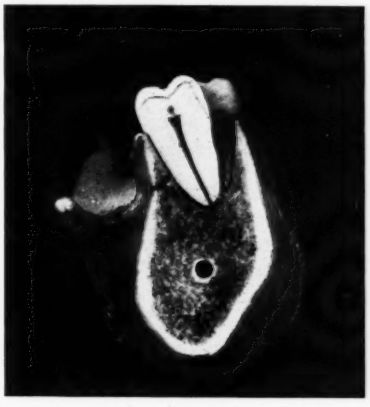

Fig. 6—Buccal alveolar process fracture, excessive expansion and laceration of the overlying gum tissue resulting from forceps pressure without surgical preparation.

must be surgically reduced in height. The prominence of the inter-root alveolar septum may cause it to extend from the socket and remain unprotected by the blood clot unless materially reduced by surgery. When the alveolar process is left unprotected a degenerative process must take place to reduce it in height to a degree which makes possible the protective regeneration of gum tissue. This repair period is extremely painful and is often referred to as a "dry socket." Correctly cared for tissues do not pass through such a period.

Other Causes of Postoperative Complications

1. When dull instruments are used to cut bone its substance is compressed for some distance in all directions, resulting in an inhibited blood supply. Therefore, all instruments should be sharp to sever the bone fibers without disarrangement.

2. The use of the alveolar process or adjacent bone as a fulcrum for instrumentation in the removal of a tooth produces marked bone trauma often resulting in a sequestration of the bruised part. Also, a portion of the anterior border of the ramus, when used as a fulcrum for elevating the lower third molar from its socket, may sequestrate accompanied by marked pain and trismus. Loosened segments of the alveolar process, allowed to remain in the socket, produce a dull throbbing pain which continues until they are resorbed or exfoliated.

3. Instrumental penetration of the lingual plate, usually the lower, can result in extreme postoperative soreness and pain. Débris is apt to be carried lingually beyond the plate and produce a subperiosteal infection. Any of these complications can become serious according to the extent of its tissue involvement.

4. Surgical equipment should by all means include the suction-pump and aspirating tip. Sponging is not sufficient to maintain clear vision of the deep operative field, nor can it remove, from the smaller interstitial spaces, the débris which, if allowed to remain, becomes an irritant and a potential source of infection. Cotton pledgets should never be used as sponges because fibers often adhere to the tissues and remain in the blood clot.

5. Use of extreme heat or cold in postoperative care produces thermal shock to the tissues. Cold compresses, to be used for the first twelve hours, should be prepared with water of about 60° F.

6. Many forms of incisions are obviously the cause of postoperative complications in that they do not take into consideration the variations in anatomic form or tone of the tissues in which they are made. Numerous cases of postoperative sore throat, following the removal of the lower third molar, are due to the incision that passes directly distal from the second molar into the tissues of the lateral throat form thus failing to adhere to the natural buccal angulation of the ramus. This postoperative complication is also due to operative intervention with the thin lingual osseous wall or lingual third molar tuberosity of the lower dental ridge. Such a condition is often referred to as postoperative peritonsillar abscess, but it is due to traumatic injury of the lateral throat tissues. The mandibular injection for anesthesia is often unfairly blamed for similar cases of postoperative disturbances.

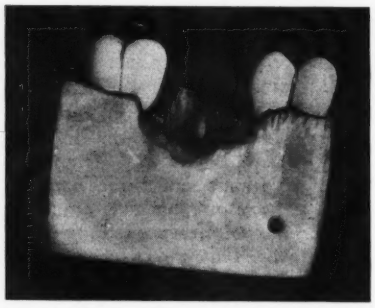

Fig. 7—Buccal view of dissected specimen showing loss of buccal alveolar plate and interproximal septa as the result of excessive forceps pressure applied for removal of lower first molar.

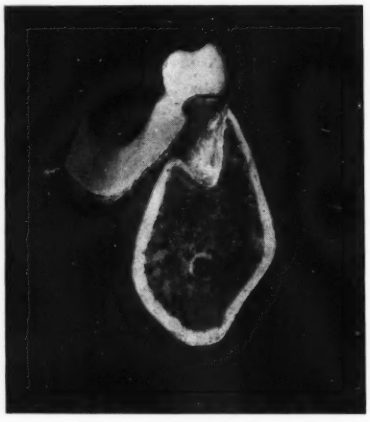

Fig. 8—Cross section through mesial root socket of the lower first molar where loss of alveolar process, as shown in Fig. 7, permits the lacerated and unsupported gum tissue to collapse into the socket. Postoperative complications usually follow.

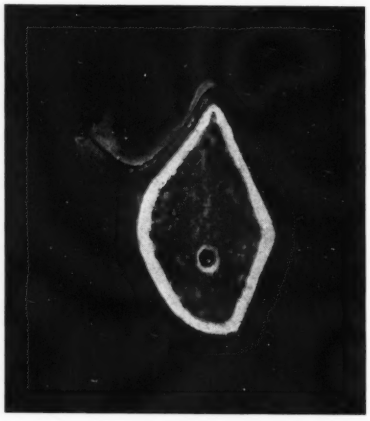

Fig. 9—Cross section through the mandible in the first molar region showing the knife-edge ridge which may be the result of the mutilation and loss of the buccal alveolar process, as shown in Figs. 7 and 8.

7. Some methods and instruments used in tissue retraction traumatize tissue and result in pain. It must be remembered that repeated retraction of lips, cheeks and mucoperiosteal flaps causes trauma of these tissues and that the least manipulation possible sometimes causes swelling and pain. Various forms of claw retractors, which depend on a retentive grip of the flap around the fold of its base, exert constant tension causing overmanipulation. This form is also apt to force débris deep under the periosteum which may result in postoperative abscess well apart from the field of operation.

Postoperative trismus is the direct result of some faulty surgical procedure if it is more than a slight temporomandibular stiffness.

8. Complications occurring in the region of the maxillary sinus may be avoided by a preoperative interpretation of the roentgenograms and an understanding of the variability in size and relation of the sinus to the apexes of the roots of the maxillary teeth.

9. Surgical trauma of the mandibular canal from the removal of the lower third molar often occurs because of pressure and forceful methods of tooth removal. This complication may result in extreme pain or in postoperative anesthesia of the lower lip. Either case is the cause of considerable worry, to say the least, and the latter sometimes ends before the courts. Again, preoperative diagnosis and correct surgical procedure avoid the majority of these difficulties. When these difficulties do occur, as the result of needless or neglected operative methods, they may be classified as a form of mutilation.

10. To maintain a sterile blood clot in all sockets of extracted teeth is vitally important. This depends on the form and condition of the remaining tissues, which in turn depend on the surgical technique employed in the

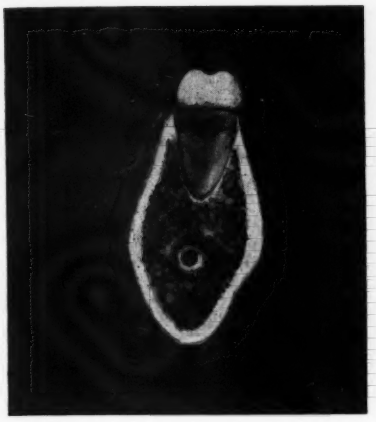

Fig. 10—Cross section through the socket of the mesial root of a lower first molar which has been removed without mutilation or expansion of the investing tissues. The interroot septum has been slightly reduced.

Fig. 11—Correctly followed surgical methods of tooth removal and slight reduction of both lingual and buccal plates permit the gingiva to overlie the alveolar process for bone protection and blood clot retention.

Fig. 12—Cross section through the mandible in the first molar region showing normal ridge form as the result of correct tooth removal and conservation of subperiosteal bone support.

removal of the tooth. Protection of the clot is invaluable to rapid tissue repair; and it is its absence that causes the large number of cases of postoperative pain; therefore, its retention is necessary to good results and all surgical steps should imperatively be directed to that end.

Continuous postoperative rinsing washes the clot away and destroys its protective value. The normally retained clot begins to distintegrate in from three to five days. During this period it functions as no artificial material can begin to function. As disintegration begins gentle irrigation of the tissues with physiologic solution of sodium chloride should be instituted regularly until tissue repair reaches the stage of a self-cleaning wound. This method proves equally effective for large or small cavities, but its success depends on regularity of treatment.

11. Surgical packings, designed to take the place of a blood clot, postpone tissue regeneration and often produce tissue mutilation in its worse form. Irrespective of form or material these packings interfere with the natural excretion and drainage of the tissues and in no way aid in tissue repair or support. Perhaps, as a palliative treatment in mutilated cases left unattended, some form of paste packing has its advantages in the alleviation of pain. But it is surprising to note the many instances in which packings are used as routine procedure in the belief that they avert postoperative complications, or are an aid to tissue regeneration.

612 Exchange Bank Building.

The Surgical Temperament

Haste or anxiety to complete the removal of a tooth is probably responsible for the major portion of operative mutilation of tissues. However, haste does not induce a speedy completion of the case but rather is responsible for its prolongation, as the natural result is confusion. Fear is usually the basic cause; that is, some form of doubt, uncertainty, distaste or reluctance to carry out the work, may, and often does, handicap an operator in surgery who, in other branches of dentistry, displays the most skillful adaptability to his work. At times, the reason is a total lack of regard for the patient's rights and this attitude is maintained irrespective of admonitions. The operator assumes that Nature is all-sufficient in her ability to repair injury. To the analytical mind such an attitude is indicative of ignorance or laziness or a determination to ignore the newer observations of the profession.

If fear or uncertainty on the part of the operator as to the outcome of the case could be self-contained it might not influence the result, but it proves to be an easily communicated feeling, obvious to others concerned in the case and extremely upsetting to the patient. The applied psychology of the operating room demands an atmosphere of confidence and a complete absence of uncertainty in both speech and manner of those in charge.

Many cases are undertaken despite lack of proper equipment which obviously interferes with a successful termination. Also, faulty anesthesia is responsible for a great deal of haste and many moments of valuable time are lost in the repetition of incorrect injections, all of which has its deleterious effect on the mental state of the patient.

The fracture of a tooth which leaves the remaining segment deeply embedded, or which involves the maxillary sinus or mandibular canal, may confuse the operator, frighten the patient, and harmfully impress all concerned. Haste to correct the harm usually further complicates the work; whereas a calm and intelligent preoperative diagnosis would have forewarned the operator of the occurrence or indicated a technique that would have prevented it.

Some men admit that they dread the arrival of a new patient for fear the case may require the removal of teeth; nevertheless, through false pride or for other reasons, they continue to attempt such cases. No doubt the infrequency of surgical cases is responsible for a lack of adaptability of some men to the work, although there are others professing a distinct preference for surgery who produce no better results. This is not an indictment of dentists for doing their own surgery, but it is intended to emphasize the importance of overcoming many of the difficulties they encounter by an honest analysis of themselves and the conditions of their patients, so that dentistry as a whole will be benefited and confidence in its integrity be more firmly established in the minds of the public.

A COMPLETE FULL DENTURE TECHNIQUE

FOURTH OF EIGHT INSTALLMENTS: REGISTRATION OF CENTRIC OCCLUSION

C. J. STANSBERY, D.D.S.
Los Angeles

1. The tentative set-up, as described in the June installment, is tried in the mouth and any further changes are now made which the requirements of the case demand. If error has been made in the vertical height, previously assumed to be correct, now, at the chair, is the time to correct it. While one may closely approximate this vertical height by the aid of the facial templet, one's judgment is not so accurate while viewing the patient wearing base plates and bite-rims; neither way is infallible. This relation is not to be opened or closed on the plain line articulator. The plain line instrument in this technique is used *only* as a device to maintain a previously set relation between the casts, and its hinge has no function other than a convenience in handling. In this final esthetic arrangement the vertical height may be changed, and if it is, the upper cast is removed from the articulator and remounted to conform to the height of the accepted set-up.

As enumerated in step 11, installment 3 (DENTAL DIGEST, June), the plain line articulator had on it: A, casts, correct; B, vertical height, correctible; and C, closure, correctible. At this point the vertical height is correct and only the closure or centric relation remains for attention. Doctor Gysi[1] says:

> Any alteration of the height of the bite is a chair and not a laboratory operation. If the height of the bite is to be changed it is better to do it at the chair, then detach one cast from its support and reattach it in the new position, than to seek to change the bite by lengthening the incisor pin or by any other similar method.

2. The acceptable vertical height having been established, with such changes in the anteriors as any change in height has made necessary, attention is next directed to the arrangement of the posterior teeth. The lower bicuspids and molars are set over the crest line of the ridge and the uppers to occlude with them. The lowers are set at a height to be determined by the following test:

The patient is instructed to close, moisten the lips with the tip of the tongue, and open slowly; this is repeated a number of times, the slowness of the action being stressed. The result will be that after the second or third opening the tongue will maintain its rest position and not curl up nor back away from the lower incisors. With the tongue in this rest position the lower posterior teeth should never exceed in height the level of the tongue, and preferably should be 1, 2, or 3 mm. below this level. The greater the ridge absorption the greater the need that these teeth be set low to lessen the leverage incident to tooth height. It is a good rule to set the lower anteriors as nearly as possible over the ridge and the incisal edges level with the lower lip at rest.

There have been given three rules, one for the upper anteriors, one for the bicuspids and molars, and one for the lower anteriors. Fortunately in average cases they blend nicely one into another; however, in other types of cases the dentist is called on to use all his ingenuity to compromise with the various requirements.

3. The bases carrying the registration plates are now replaced on the plain line articulator and if the bite has been opened the screw is raised to make contact again with the upper registration plate. In raising to make this contact, one should be sure the screw still has a reserve range of two full turns before reaching its maximum elevation (Fig. 36). If the bite has been closed, the heater block is used as in the original mounting.

If at this time the operator observes that the upper base plate is not fitting with the same degree of snugness as when first made, it is due to changes in form from mouth warmth and biting pressure while the lower impression was being made. To correct this looseness, a roll of modeling compound about pencil size is placed in the upper base plate around the entire crest of the ridge and warmed thoroughly to a slow flow. The upper cast is dipped in cold water, the screw of the lower plate is dropped one or two half turns, the upper base plate replaced and the articulator quickly and firmly closed to the accepted height. The modeling compound will flow up both sides of the ridge, saddle-like, restoring the original stability; it is immaterial whether or not the vault portion is in contact.

The placing of the roll of modeling compound in the groove must not be allowed to increase the vertical opening and it will not do so if the articulator is completely closed. Its only purpose is to produce a bearing surface against the ridge, which exactly duplicates the denture to be made over this cast. If one has been extremely careful to keep the base plate cold during the entire procedure of lower impression taking this tightening step will probably not be necessary. The absence of vault contact will ensure the support of the ridges only and eliminate any tendency of the base plates to tilt during check-bite procedure. Each base plate now accurately fits its cast and when replaced in the mouth will fit as did the original impressions and as will the finished dentures.

4. The registration plates are now lubricated with cocoa butter, placed in the patient's mouth, and the patient is instructed to close firmly, the screw of the lower registration plate being brought in contact with the upper plate.

Here one should pause for an analysis of the procedure thus far and the conditions now existing in the patient's mouth. The mandible is sustained against the base of the skull by three points of support, namely, the condyles and the screw of the registrations plates. The forces

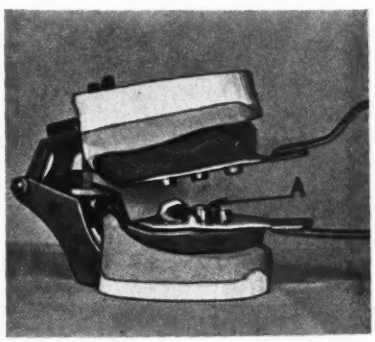

Fig. 36—Screw, A, in lower registration plate is raised just enough to contact with upper when in correct vertical height.

[1]Gysi, Alfred: Practical Application of Research Results in Denture Construction, J. A. D. A. **16**:206 (February) 1929.

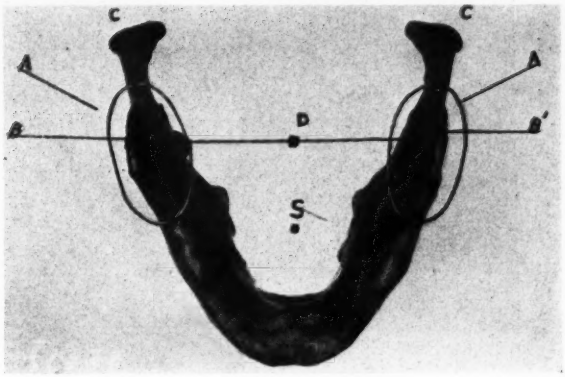

Fig. 37—A, Area of muscle attachment; B, B′, represent the muscle forces; C, C, condyles; D, represents combined muscle force of B and B′ at a point midway between them; S, screw support of the registration plate.

that hold it in this position are the muscle forces, B B′, centering around the coronoid processes. It is obvious that the two muscle forces could be represented by a single muscle of twice the strength of either, if attached at a point midway between the coronoid processes. Viewed from beneath, this point is practically equidistant from each of the condyles and the supporting screw. Fig. 37 shows this view of the mandible. The oval areas, A, outline the muscle attachments on each side of the mandible. As the mandible by its form may be considered a solid body, the same muscle force would be obtained if a muscle were attached at the midpoint, D, exerting a force equal to the sum of the other two. If this point, D, is considered as the muscular force that is drawing the mandible upward, it is obvious that the mandible is supported against the base of the skull on a tripod consisting of the two condyles, C, and the screw contact of the registration plates, S. This puts the entire mandible in the state of stable equilibrium against the base of the skull. The condyles, being supported on the inclined surfaces of the glenoid fossae, tend to retrude under this muscle pull to their most retruded position and to this is added the posterior pull of the temporal muscles; all these conditions combine to place the mandible in correct centric relation.

The next condition to be observed is that of bearing against the ridges. The surfaces of the base plates are exact duplicates of the impression and denture surfaces. These base plates being held against the ridges by a central point of bearing, instead of bite rims in contact, are delivering under biting pressure the same force against each ridge; the right side exactly the same as the left and the upper the same as the lower. The resiliency of this underlying tissue, and especially its horizontal mobility, have been the principal sources of difficulty in the accurate registration of the jaw positions with the methods commonly in use. A review of the technique thus far will bring to the attention the fact that this tissue has been subjected to only one direction of force, and that is the vertical direction. One of the outstanding features of this technique is that this vertical force eliminates the rebound of the resilient ridge tissue. Even under this heavy vertical pressure the addition of a slight horizontal force will cause a wide range of movement. This horizontal force is avoided by a thorough lubrication of the screw against the polished surface of the upper registration plate. This combined vertical and horizontal stress is found under base plates where methods are used allowing base plates to exert horizontal force upon each other. All the methods of grinding in bite-rims or taking tracings on them by rubbing one against the other are open to this criticism.

In discussing the errors on check-bite records Doctor George P. Phillips[2] is authority for the following statement:

> I have spoken of the errors that are likely to enter into the reproduction of mandibular movements when ordinary bite plates are used; in the hands of by far the majority of operators this method is worse than useless. One serious objection to the check-bite method is the almost inevitable tripping of the occlusal or trial plates in the mouth when the mandible is placed in lateral position to obtain check-bites. I have had this happen repeatedly and so feel quite positive that no part of the occlusal rim of one trial plate must touch its opposing mate during lateral position.

In a comment on bite-rims Doctor Gysi[3] also quotes these statements from Doctor Phillips and says that, "Careful workers are much dissatisfied with wax or compound check-bites," and concludes with the statement, "The only check-bite method that I know to be scientific and practicable is that shown by Stansbery."

The third condition to be observed in the mouth concerns the height of the screw. This height has been verified by our accepted set-up and the ridges are in the same relation to each other as they were with the set-up between them.

5. The registration of centric occlusion is the next step. The highly polished surfaces of the registration plates and the screw being lubricated with cocoa butter make it impossible for one plate to exert any horizontal force upon the other; the cocoa butter also facilitates the removal of the plaster check-bite registrations. With the smoked graph plate and the style securely attached, the patient opens and closes at ease and at each closure the operator makes a small dot on the graph plate with the point of the style. This natural closure will be recognized as the one that many operators use for their centric relation. The location of this point will probably be influenced by the rest position, habits formed by previously worn dentures, or by malocclusion of natural teeth. After the true centric relation is found by the method about to be described, one notes whether or not this point coincides with that of true centric position.

6. The patient is now instructed to maintain a constant, moderate biting pressure and put the mandible through the movements of protrusion and retrusion. From the retruded position the patient is asked to move the mandible first to the right, to return to the retrusive position, and then to the left; all these movements are recorded by the style on the smoked plate (Fig. 38). These records on the graph plate are a necessary and an integral part of the check-bite technique, indicating to the operator the exact positions of the mandible. If the operator's eyes were sufficiently keen to detect with accuracy a point to which the patient had moved 3 mm. laterally from cen-

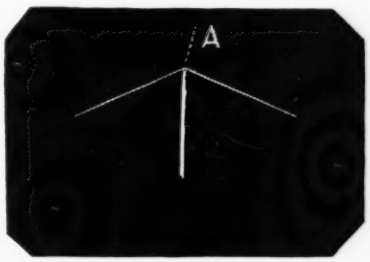

Fig. 38—Tracing resulting from lateral and protrusive movements. Point A, the position of the style for correct centric relation.

[2]Phillips, G. P.: Fundamentals in Reproduction of Mandibular Movements in Edentulous Mouths, J. A. D. A. **14**:413 (March) 1927.

[3]Footnote 1, page 210.

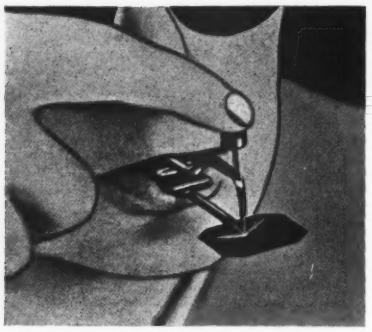

Fig. 39—Note the point of style exactly at apex of tracing, the position for centric occlusion.

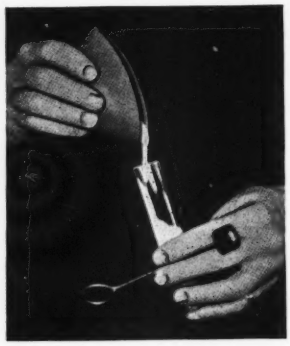

Fig. 40—Pouring the plaster mix from bowl to syringe.

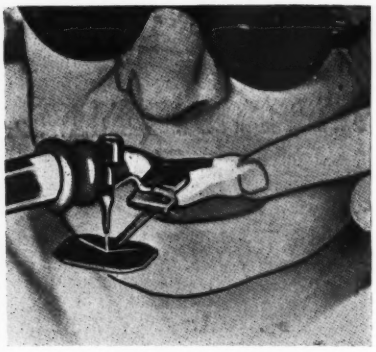

Fig. 41—Plaster injection for centric occlusion check bite.

tric and to observe errors in centric relation of a fourth of a millimeter, these appliances would not be necessary. If the retrusive position records also the correct centric relation, the two movements, one to the right and one to the left, will record tracings both beginning at the retrusive point (Fig. 39) and forming a definite angle with each other. The design will be an arrow head or Gothic arch.

In a report by the National Society of Denture Prosthetists,[4] centric relation is defined as follows:

The mandible is in centric relation when the heads of the condyles are in their most retruded position from which the jaw can make free lateral movement. The use of the needle point tracing device for the purpose of determining and checking centric jaw relation is recommended as being both scientific and practical. *The Society recognizes no other means of verifying centric jaw relation.*

The centric relation should not be confused with the rest position into which the mandible relaxes when not subjected to muscular strain.

7. Once more the patient is asked to assume the retrusive position which is to be verified by the style being exactly at the apex of the arrow. While holding perfectly still in this position and under a moderate biting pressure, a quick setting mix of plaster of Paris is injected to fill completely the space between the registration plates.

A solution of one part of saturated solution of potassium sulphate and one part water used with three parts of Snow white plaster, number 1, is satisfactory for this purpose; these parts refer to volume. This proportion gives an initial watery mix which when thoroughly mixed should be poured into the syringe held as in Fig. 40, with the little finger over the nozzle. The bowl is placed under the syringe and the plaster allowed to run back into the bowl; this operation is continued for a few moments until the plaster is of a creamy consistency. The plunger is then inserted and with the tip of the syringe between the registration plates the plaster is flowed between them (Fig. 41). The mix, as described, should be sufficiently set for removal in a minute and a half or two minutes.

8. When set, the base plates and the plaster check bite are removed intact and submerged in cold water to absorb the heat of plaster setting. The base plates should then be carefully separated from the plaster check

(Continued on page 265)

[4]Report by the N. S. D. P.: J. A. D. A. **17**:1123 (June) 1930.

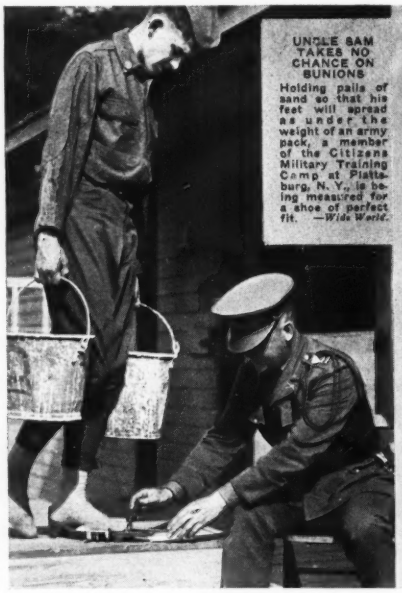
UNCLE SAM TAKES NO CHANCE ON BUNIONS
Holding pails of sand so that his feet will spread as under the weight of an army pack, a member of the Citizens Military Training Camp at Plattsburg, N. Y., is being measured for a shoe of perfect fit. —Wide World.

Fig. 42

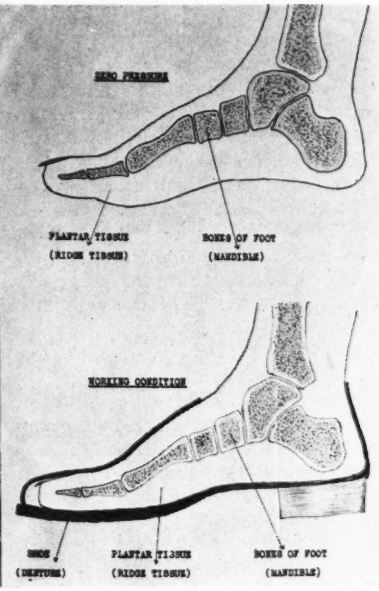

Fig. 43 (top) Fig. 44 (bottom)

A COLLATERAL STUDY

Figs. 42, 43, and 44 should be studied with the following questions in mind: Is it possible to take a measure of the pendent foot, Fig. 43, and construct a comfortable shoe? What would be the effect on the foot of standing in a shoe made from such a form? Could a shoe made of the form as in Fig. 44, be made from measurements taken from other than the foot supporting weight? Does it not seem logical that the shoe should fit the foot under the condition in which the foot is to be used? Would the shoe of proper fit in standing have the same accuracy of relation to the bones of the foot if shoe and foot were pendent? Does Uncle Sam know his business in this procedure?

A dental parallelism of the legend in Fig. 42 might read: "Biting so that the ridge will take the form as under masticating stress, a patient is having check bites taken (or impressions made) for dentures of perfect fit."

These questions should now be reviewed substituting for the shoe and foot their dental counterparts, as indicated. The answers to these questions should be enlightening.

IMMEDIATE DENTURES

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THE original type of immediate denture was made of a heavy base plate on which were set six or eight anterior teeth; the posterior rim was made of sealing wax to afford a support for the jaws, and the anterior teeth did not occlude. This denture was temporary, and was to be worn only during the time in which the regular dentures were being made. If the patient can tolerate a denture of this type, which is a crude piece of work with practically no fit at all, then he should certainly be able to wear a correctly made immediate denture.

The removal of teeth may be rightly termed "causing a deformity," which, if neglected, will cause considerable disturbance to the human body. Why allow this deformity to remain when by the insertion of immediate dentures this can successfully be prevented? I am firmly convinced that as dentists we should consider it an important matter not only to suggest immediate dentures to a patient but to insist on them so far as possible. Some dentists say, "I do not suggest immediate dentures because I cannot get a sufficient fee to justify all the time it would take to make them." Immediate dentures require far less time and are easier to make than regular dentures.

Advantages of Immediate Dentures

1. *Protection of the alveoli against trauma and infection*—Food and oral secretions are prevented from entering the tooth socket since the denture acts as a gate over the openings preventing such entrance.

2. *Prevention of hemorrhage by supporting the blood clot*—Regardless of the condition of the blood or how much bleeding there may have been after previous extractions, by saturing the gums (or, if necessary, by cauterizing with the electric cautery, or with trichloracetic acid), the hemorrhage will cease in a few minutes after the dentures have been inserted.

3. *Healing is more rapid and there is less operative pain*—Because infection is prevented and the tissue is kept clean and covered with a healthy blood clot, healing begins almost immediately. Patients who have returned for postoperative treatment certify that they have had practically no pain, and are amazed at the comfort they experience. With the dentures inserted, the pressure is on the posterior part of the ridge where the teeth have previously been extracted; the tissue is capable of withstanding some force rather than pressure, since it is not applied on the so-called green area. This is brought about by arranging the teeth so as to prevent direct pressure over the recently extracted area.

4. *Prevention of the distortion of the facial outline*—By the immediate insertion of dentures, the tone of the tissue is not lost, the original intermaxillary space is retained, and the general outline of the muscles of expression is unaltered.

5. *There is far less resorption resulting in a more dense ridge*—If it were possible to measure the exact amount of absorption of the ridge when the posterior teeth have been extracted and no substitute inserted for some time, then extract the anterior teeth and immediately insert a denture, and after a year measure the amount of absorption that took place in both regions, it would be found that the absorption in the posterior region would be much greater than that in the anterior region. This may be due to the ability of being able to place the artificial teeth in the same relationship to the crest of the ridge as the natural teeth were, or because it is possible to maintain the exact intermaxillary distance, or because the patient has had no chance to create any abnormalities whatever.

6. *Enunciation is unchanged*—a patient allowed to remain edentulous for some time must learn an entirely new method of enunciation which requires considerable time. Then after the insertion of dentures the same procedure must be repeated. If immediate dentures are inserted, a patient will experience practically no change in enunciation whatever.

First Appointment

1. A complete roentgen examination is helpful.

2. The oral tissue and teeth should be examined for pathologic conditions.

3. Note should be made of the height of muscle attachments, especially the labial and lingual frenums; the condition of the saliva, and the size of the tongue.

4. All infected teeth and infected areas should be noted.

5. Before the teeth are extracted a piece of 25 ampere fuse wire is adapted to the median line of the face from the bridge of the nose to beyond the base of the chin (Fig. 1). This

Fig. 1—Fuse wire adapted to the face.

wire is transferred to a cardboard and the face portion is cut away (Fig. 1 A). Thus a silhouette of the exact size of the patient's profile is obtained. The negative part of the profile may be placed against the median line of the face at the various steps in the construction of the denture to verify the correct positions and contours (Fig. 1 B). This record is advantageous when the patient is permitted to be edentulous for some time, and as a record against which to check the amount of absorption after dentures have been worn.

Technique for Preextraction Record

1. An outline of the facial contour is made by means of a fuse wire (Fig. 1).

2. The distance is measured from

Fig. 1 A

Fig. 1 B

Figs. 1 A and 1 B—Silhouette profile; exact size and contour.

the base of the nose to the incisal edge of the upper anterior teeth; from the incisal edge of the lower teeth to the base of the chin, and from the inferior margin of the orbital cavity to the incisal edge of the upper anteriors (Fig. 2).

3. Some dentists use the roentgen ray to make a silhouette (Fig. 3), but any means may be used so long as some preextraction records are made, even if dentures are not to be made. These records may be needed by the dentist for his own protection as well as for a guide for future work in the individual case.

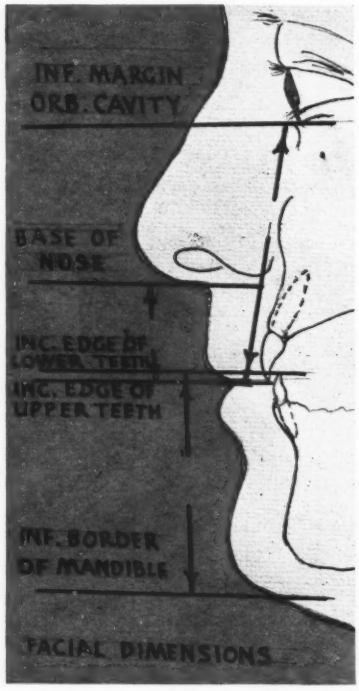


Fig. 2—Outline showing the various sections of the face to be measured prior to extraction.

Fig. 3—Roentgenogram. Silhouette cut through at the median line. A, the negative portion; B, the positive.

Impressions

1. A full impression is taken with one of the elastic impression materials, from which record casts are made. I prefer to use Dentocoll (Fig. 4).

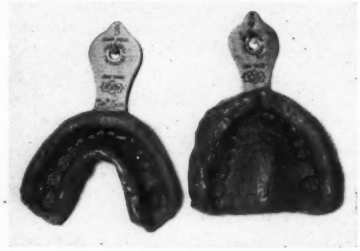


Fig. 4—Straight Dentocoll impression of the natural teeth.

2. After the impressions have been taken and casts poured, a face-bow transfer is taken for the purpose of correctly mounting the casts on the articulator (Fig. 5).

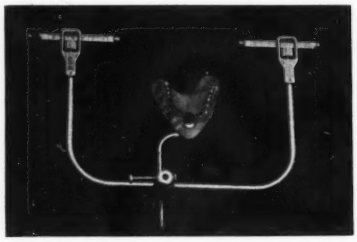


Fig. 5—Face-bow with bite register in position for mounting casts.

Fig. 6—Left, right, and protrusive bite registers for setting the condyles.

3. Centric occlusion and right and left lateral bites in wax are next taken for the purpose of mounting the casts and setting the condyles (Fig. 6).

4. The next step is to mount the casts on the articulator with the use of the face-bow transfer record previously made (Fig. 7).

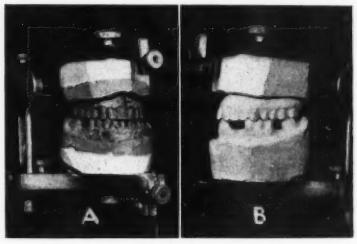


Fig. 7—A, Original record casts; B, record casts made after the extraction of the infected teeth.

5. Next the shade of the teeth and approximate mold are selected. This concludes the preliminary work which is followed by the first surgical procedure; namely, the extraction of all infected teeth and the posterior teeth, because the larger sockets of the posteriors heal more slowly. The patient is then discharged and allowed about ten days or two weeks to build up or regain bodily resistance.

6. At the second appointment a thorough examination is made of the work previously done in the mouth, including a recheck of the shade selected in order to satisfy one's self that the shade is correct and that the mouth is in good condition to take the impression for making the cast on which dentures are to be made. It should be remembered that up to this time the natural anterior teeth are still in the mouth.

Impression Technique

1. A good compound impression is taken in the mouth, including all areas on which the denture is to rest; the impression is removed just before the compound sets.

2. A snap cast of plaster is made.

3. A tray is conformed to this snap

cast which will permit one to take a good impression without too much bulk.

4. A compound impression of the cast is taken, and all excess trimmed off.

5. All undercuts are relieved around the remaining teeth.

6. The trimmed impression is inserted in the mouth, and note made if it will include all areas on which the denture is to rest. This is a good time to muscle trim the compound impression. If corrections are indicated, they should be made, and the compound impression postdammed (Fig. 8).

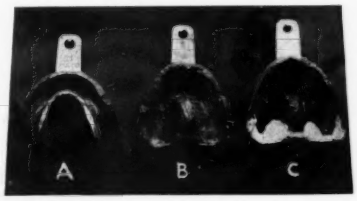


Fig. 8—A and B, Trimmed compound impressions of record casts; C, compound impression muscle trimmed and postdammed.

7. In this impression a Dentocoll wash is used. By using compound as a tray, and a Dentocoll wash a more detailed impression is obtained than with straight Dentocoll. A denture made from this type of impression affords retention by adaptation and adhesion rather than overcompression of tissues, as with other materials (Fig. 9). From this impression the

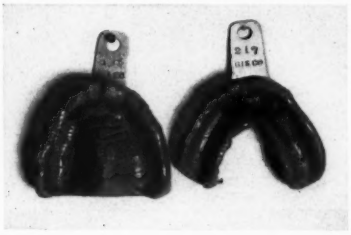


Fig. 9—Compound impressions with Dentocoll wash of the remaining natural teeth.

casts are made on which the dentures are to be made (Fig. 10 A).

8. In order to mount the working casts in centric occlusion, a roll of soft compound is placed in the mouth over the crest of the ridge and the patient closes into centric occlusion. These blocks are thoroughly chilled in the mouth, then transferred to the casts and used as bite block registers to mount the casts on the articulator. The condyles of the articulator on which the working casts are mounted are now set to correspond with those on the articulator on which the record casts have been mounted. One may

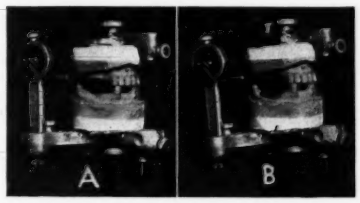


Fig. 10—A, Working casts mounted; B, working casts mounted with compound bite block registers in position.

likewise use the original face-bow transfer record or make a new record for mounting the working casts (Fig. 10 B). A good base plate is then adapted to the casts, the bite rims built up, and the posterior teeth set up.

9. In order to set the artificial teeth in the same relationship to the crest of the ridge as the natural teeth were, a piece of copper wire is contoured over the incisal edge and through the sulci of the posterior teeth of the original record cast (Fig. 11 A) and transferred to the bite block or the working cast where it is used as a guide to establish the cranial relationship of the artificial teeth (Fig. 11 B).

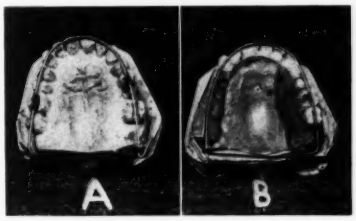


Fig. 11 A—A, Copper wire conformed over the incisal edge and through the sulci of the teeth of the record cast; B, same wire transferred to and used as a guide for setting the teeth on the wax rims.

10. The posterior teeth are set up and the bite is verified in the mouth (Fig. 12 A). If this is correct one proceeds to set up the remaining teeth. I prefer to cut off one or two

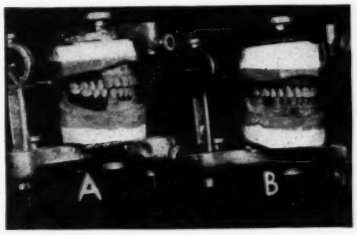


Fig. 12—A, Posterior teeth set up on the working cast ready for try-in; B, the upper denture showing perfect occlusion with the original lower record cast.

teeth at a time from the plaster cast, scraping enough from the labial of the cast to permit space for the thickness of the labial rim over the ridge lap of the teeth, and the base of the dentures, as is shown in Fig. 13 A. In my opinion, all dentures should have a labial rim as this adds considerably to the stability and comfort of the denture inasmuch as one depends greatly on peripheral adaptation for retention.

Just how much should be trimmed from the cast is shown plainly on the casts in Fig. 13. When trimming off the anterior teeth, one should not trim beyond the lingual curvature at the gingival line of the teeth as is shown in Fig. 14. One should not hesitate to remove plenty of the labial rim of the working cast when setting up the anterior teeth. It is necessary to keep in mind that the average thickness at the neck of the anterior teeth labio-lingually is 6 mm. Then if a little of the labial plate of bone is removed and added to the dimen-

Fig. 13—A, The black triangular marking shows the average amount of teeth and labial surface of the cast removed prior to adding the remaining anterior teeth to the previously set up posterior teeth. B, Lingual view of the working cast after trimming has been completed. C, Cast showing the average amount of process removed from the ridge in order to produce a good smooth foundation upon which the dentures are to rest. The right side was correctly trimmed before the tissue was sutured, and the left side was allowed to heal without trimming the process. This is extremely important in all extraction cases.

Fig. 14—Lingual extent of the removal of plaster and teeth from the working cast.

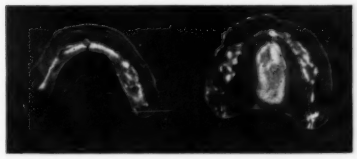


Fig. 15—Upper and lower celluloid matrix which has been pressed over duplicate casts made from the working casts investing the case.

sion of 6 mm. there will be a thickness of approximately 9 mm. It is safe, therefore, to remove about 9 mm. from the labial rim of the working cast at the *crest of the ridge,* and *to taper the rim sharply* to a height of about 9 mm. for the average case. These dimensions pertain to the upper cast only; the lower is trimmed proportionately less.

If the operator does not do the extracting himself, then as an aid for the exodontist, a transparent celluloid matrix is conformed over a duplicate cast from the one on which the denture is to be completed and given to the exodontist who will use it as a guide in trimming off the proper amount of process (Fig. 15). After the teeth have been extracted the celluloid matrix may be inserted to locate any portion of the process still requiring removal. The dentures are completed, and the patient is asked to return for the extraction of the remaining teeth and insertion of the finished dentures.

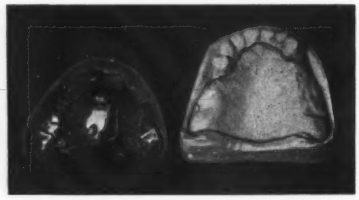


Fig. 16—Outline on working cast for a metal base.

These dentures are by no means temporary, and I firmly believe that whenever it is possible they should be suggested to all denture patients.

The success of the work depends on (1) a correct diagnosis; (2) the age and cooperation of the patient; (3) good impression and casts; (4) *proper face-bow* registration; (5) correct mold and shade of teeth; (6) *the correct amount of plaster trimmed from the labial of the working cast;* (7) balanced occlusion at all cost; (8) proper peripheral adaptation, and (9) proper relief of the rest of the denture.

Figures 17 and 18 show the various areas to be given consideration when making full dentures.

Fig. 16 shows the outline on the working cast for a metal base. The technique is the same as that used with vulcanite or any of the condensites. The only difference is that a metal base is cast or swaged instead of a base plate being adapted to the working cast.

Figures 19, 20, 21, 22, and 23 are of a patient, aged 20, in whom the only occluding teeth were the upper and lower left first molars. The lower anterior teeth touched the lingual tissue back of the anterior palatine foramen. The lower left first molar required extraction because of an infection. After the extraction, the lower anterior teeth penetrated the tissue 1.5 mm. in the region of the anterior palatine foramen. The lower right first and second molars and the upper left bicuspids had been extracted several years previously. The lower left third molar was partly erupted and the right third molar was submerged. There was a protrusion of 16 mm. of the upper anterior centrals and about 12 mm. of the laterals as shown in Fig. 19 A.

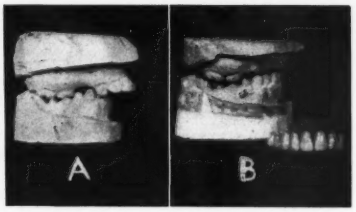


Fig. 19—A, Protrusion of 16 mm. of upper anterior central and about 12 mm. of the laterals; B, process trimmed back about 10 mm. at gingival area of upper six anterior teeth which were extracted.

The upper six anterior teeth were extracted and the process trimmed back about 10 mm. at the gingival as shown in Fig. 19 B. A partial upper plate was made to replace the six anteriors and the two bicuspids which are shown in the foreground of Fig. 19. The insertion of the partial plate reduced the protrusion of the upper

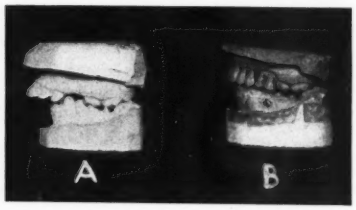


Fig. 20—Insertion of partial plate reduced the protrusion of upper teeth from 16 mm. to 6.5 mm. (B).

Fig. 21—Anterior view of record casts.

Fig. 22—Change in contour of anterior teeth. A, Partial denture in place; B, lingual cranial outline of natural teeth.

Fig. 17

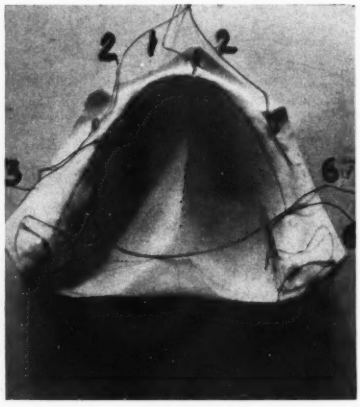


Fig. 18

Figs. 17 and 18—Various areas to be given consideration when making full dentures: (1) Relieved for anterior palatine foramen; (2) hard bulbous tuberosity requiring surgical removal; (3) anterior limit of compressible tissue; (4) relieved for posterior palatine foramen; (5) ligamentum attachment; movable tissue begins; (6) spine at posterior of median line may require relief; (7) anterior limit of postdam; (8) extreme length of plate; (9) soft, flabby ridge requiring special technique; (10) deep relief over bony prominence in median line; (11) additional area requiring relief; (12) anterior limit of compressible tissue, and (13) hard bulbous tuberosity requiring surgical removal. *Lower Cast:* (1) relieved for labial and lingual frenums; (2) relieved for mental foramen; (3) the impression is relieved if the crest of ridge is sharp; (4) and (5) area of lower impression to be postdammed; and (6) mylohyoid ridge or spine. Overextension usually causes difficulty.

teeth from 16 mm. to 6.5 mm. as is shown in Fig. 20 B.

The technique for immediate dentures as previously described was used in the correction of this case. Fig. 21 shows an anterior view of the record casts. Fig. 22 shows the change in contour of the anterior teeth. A, shows the partial plate in place, and B, the lingual cranial outline of the natural teeth.

Restoration of the Lower Teeth

Cast crowns were made for the lower second bicuspids, the occlusals of which were made large enough bucco-lingually so as to occlude with the upper bicuspids. The height of the crown was made sufficient to occlude with the upper bicuspids when the lower anterior teeth would strike against the base of the partial plate.

A lower lingual bar was made to replace the lost molars on each side. The space was large enough mesio-distally for only one molar on each side. The extension of the heel of the lower partial denture was made of velum rubber which extended distally over the occlusal of the submerged third molars, which were about to erupt.

Pine and Poplar Streets.

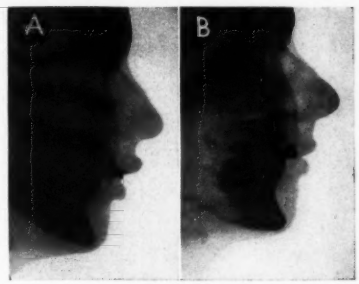


Fig. 23—Improvement of facial profile immediately after extraction and insertion of partial denture.

By using soft rubber the patient was able to apply some pressure on the tissue over the third molars without causing pain. This also brought about the eruption of the molars at a much earlier period than they would otherwise have erupted. After they erupted the soft rubber was removed and the teeth were allowed to erupt completely. Later, the lingual bar may be replaced with some type of bridgework which will be more serviceable and comfortable to the patient.

Fig. 23 shows the immediate improvement of the facial profile, B, in Fig. 23, having been made immediately after the extraction and insertion of the partial denture.

Technique for Making Celluloid Matrix

1. After the case has been invested and the wax eliminated, a piece of base plate wax is adapted to the invested cast just as one would to make a vulcanite base plate.
2. Another half flask ring is used and a full flask is made with this adapted wax base plate.
3. After the plaster has set, the flask is separated, the wax removed, and a piece of 30/1000 inch sheet celluloid placed over the cast.
4. The flask is closed and placed in a compress and then in a pan of boiling water.
5. After a few minutes the celluloid will become plastic enough so that the flask can be closed.
6. The flask is placed in cold water and chilled thoroughly.
7. The flask is separated, the excess material trimmed off, and the celluloid thoroughly cleaned. The celluloid is then ready to be tried in the mouth and used as a guide in removing the proper amount of process.

A COMPLETE FULL DENTURE TECHNIQUE

(Continued from page 260)

bite and the check bite kept in cold water until used.

This plaster disc, bearing on its upper surface the imprint of the upper registration plate and on its lower surface like imprints of the lower, has hereby made a record of the protrusive and lateral relation of these two plates; its thickness has likewise made a record of their vertical relation. This constitutes a perfect centric relation, the most important of all the jaw relations, which assures one of never "missing the bite."

The next installment, number 5 of this series, which will appear in the August number of this magazine, will deal with the eccentric relations and excursions of the mandible and their records for accurate duplication on the denture tripod.

(End of Fourth Installment)

604 Medico-Dental Building.

LETTERS

I look forward to The Dental Digest every month.—T. C. Bradshaw, D.D.S., *Richmond, Virginia*

Translation of p. 345 of *Le Semaine Dentaire* for March 19, 1933:

The Dental Digest

If a contest were held to determine which is the best dental magazine in the world and the most pleasant to read, without a doubt, the winner of the contest would be The Dental Digest.

This magazine, which has already been in existence for 37 years, since the month of January, 1931, has been completely changed by adopting whole-heartedly the better features of modern methods of printing and editing, finally creating a de luxe and easily and rapidly read publication.

To achieve this effect it is printed on laid paper, with three columns on large pages, is copiously illustrated, contains in particular numerous multicolored offset plates, and carries in each issue articles of the greatest practicality written by specialists in the different branches of stomatology.

We are happy to notify our readers that we have concluded with the publishers of this magazine an arrangement giving us the right to reprint in *Le Semaine Dentaire* some of the articles appearing in The Dental Digest.

We wish to express to the staff of The Dental Digest our very sincere thanks for the friendliness they have shown in making it possible for French practitioners to profit by the work of their colleagues.

I enjoy the Digest very much.—W. R. Hancock, D.D.S., *Center, Missouri*

I think it is somewhat of a privilege to become a subscriber to your splendid publication. A copy of the February issue arrived a few days after I forwarded the business reply card. You were to bill me later. Up to the present I have not heard from you, and feeling that you might forget to send on the March issue, I am writing these few lines as a gentle reminder. Please enter my name with the other lucky subscribers, and be kind enough to forward the January issue, if it is still available.—T. H. O'Reilly, D.D.S., *Cleveland*

These Digests must be preserved.—Joseph Nemser, D.D.S., *Brooklyn*

I have not as yet received my March issue of Dental Digest. I like the magazine very much and do not want to miss a single number.—John F. Heberlein, *Fennimore, Wisconsin*

I never want to be without The Dental Digest and want you to make a note to that effect. I am saving them for a book form.—C. H. Suitt, D.D.S., *Kansas City, Missouri*

Allow me to congratulate the profession and compliment your company for The Dental Digest. If pictures such as the child instruction ones could be printed so that they could be mounted for reflectorscope use without loss of valuable matter it would be fine.—Joseph L. Smith, D.D.S., *Denver*

WHY DENTAL CARIES WITH MODERN CIVILIZATIONS?

V. AN INTERPRETATION OF FIELD STUDIES PREVIOUSLY REPORTED

WESTON A. PRICE, D.D.S., M.S., F.A.C.D.
Cleveland, Ohio

IT was undertaken in these investigations to learn from primitive people the secret of their high immunity to dental caries in order that we may in a measure remove the scourge of rampant tooth decay from races when they come in contact with modern civilization. It has not been clear whether this rampant decay was due to habits of living, a change in the physical qualities of the food or a change in its nutritional content.

In the first two installments of this study (DENTAL DIGEST, March and April, 1933) data were presented which related to the people in high Alpine isolated districts where immunity to dental caries was found to be very high. The location of these communities was in the southern portion of central Switzerland on tributaries of the river Rhone. The third installment (DENTAL DIGEST, May, 1933) included two districts with low immunity to dental caries; one in the southeastern part of Switzerland at a similar altitude to those districts which had a high immunity; and the other in the northeastern part of Switzerland in the plains and, therefore, at an altitude similar to that of much of continental Europe, about 1000 feet above sea level. In the fourth installment, in last month's issue of this magazine, groups of people at sea level on islands off the northwest coast of Scotland were studied. The inhabitants of these islands can be divided readily into two groups, one still retaining their physical isolation which compels them to be dependent almost entirely on the primitive diets, and the other, a group in which the primitive diets have been displaced by modern foods of so-called civilization. Some of the groups studied had recently adopted modern foods, and others had done so a few generations previously. In all these groups it was found that the persons living on the primitive diets had very high immunity to dental caries and all of those who had adopted modern foods, regardless of whether they had changed their habits of life and the character of habitation, had lost their high immunity and suffered from rampant tooth decay during the periods of growth in childhood and in adult life.

It is my purpose in this installment to present the first section of an interpretation of the data obtained in order that we may formulate programs that will be competent for meeting the needs of humanity under various living conditions and in various habitations. It has already been noted what the foods eaten in these various localities are. In the Alpine communities in which was found a high immunity to dental caries the basic foods were rye and dairy products; occasionally, meat and vegetables but practically no fruit. In the Outer Hebrides in the communities with high immunity the basic foods were oat products and marine foods, and occasionally meat and vegetables. In both these countries in which immunity had been lost dental caries was found to be active and often rampant. The primitive foods had been displaced by modern foods consisting largely of refined wheat, white flour products, highly sweetened canned marmalades and jams, canned vegetables and vegetable fats.

My field studies included recording in detail the types of food making up the dietary in different communities and for different persons. In many instances samples of food were secured for chemical analysis, a study was made of the food combinations in relation to the presence or absence of dental caries. Similar studies were made as to the extent to which oral prophylaxis had entered into the production of immunity as well as such physical qualities of the food as hardness, predominance of acid or alkaline end-products, immunity to disease in general as well as dental caries, and general physical development with special consideration of the irregularities of the teeth and characteristics of facial development.

In Fig. 1 will be seen a group of children in Alpine districts providing a high immunity to dental caries. The physical expressions, regularity of the teeth and normal interrelation between the arches are shown. These children have been instructed to bite on their front teeth. The use of the toothbrush and modern dentifrices are largely unknown to these people; yet as has been pointed out the level of immunity to dental caries was very high. For the entire series of groups with high immunity the average incidence of dental caries was only 3.4 per cent of 4,280 teeth examined. Deposits were often present on the teeth and similarly there were often stains which can readily be seen on the teeth of several of the children shown. While the gums would be benefited by the removal of deposits not a single case was seen of gingival irritation in sufficiently aggravated form to be classed as so-called pyorrhea alveolaris nor was there a single case of Vincent's infection seen. The breadth of the faces, freedom of the air passages, and the general physical characteristics were excellent. Not a single case of a typical mouth breather was found among those that were immune to dental caries. The age period of this group was from 7 to 16 years.

In contrast with this there may be seen in Fig. 2 persons who were typical of those with more or less rampant dental caries in communities where immunity to dental caries had been lost. The girl at the upper right has lost many of her posterior teeth, and the upper anteriors are shown to be decayed to the gum line. The girl at the right, Fig. 2B, has a type of deformity found frequently in even young girls and boys which is produced by the early extraction of carious anterior teeth. The girl at the lower right has lost most of the posterior teeth and many of the anterior teeth have been attacked by dental caries. The incidence of caries in the susceptible group averages 25.5 per cent of 2,065 teeth examined. Many persons were seen carrying scars telling the story of pain and often long continued torture from abscessed teeth which finally developed fistulae on the outside of the face. In some cases we were told of long journeys with days of hardship and exposure in an effort to get relief from suffering. In one community a petition had been sent to

Fig. 1A

Fig. 1B

Fig. 1C

Fig. 1—Typical girls and boys with high immunity to dental caries. Toothbrushes and dentifrices were largely unknown as evidenced by the tooth stains. Note the splendid symmetry of the arches.

Fig. 2—Typical severe cases of rampant tooth decay in young people even in spite of oral prophylaxis. These people often show premature aging.

Fig. 2A

Fig. 2B

Fig. 2C

the government officials to send a dentist to the island for the extraction of abscessed teeth. These dentists sometimes had to come long distances. In many of the isolated communities dental inspectors made an annual visit largely for the purpose of taking care of emergency extractions. The dental inspector for the Outer Hebrides has his residence at Inverness on the eastern coast of Scotland, about a two day's journey to the nearest island and a week or more from some of the islands. I learned from him that his work was largely limited to emergency extractions. This is in striking contrast with the condition found in the communities, in both the Alps and the Outer Hebrides, where high immunity to dental caries was found. When I inquired in the Loetschental Valley how many physicians and dentists there were for the 2000 people I was told none at all. A medical inspector comes into the valley usually once a year and checks up on sanitation and general health, including oral health. I had a conference with him at Brig and found that his duties were so general that his dental data were of necessity limited. He gave me a copy of his report in which as he stated to me he had not made the differentiations regarding various types of pathologic lesions of the mouth and that a dirty mouth was recorded as pathologic and classed on practically the same basis as dental caries or pyorrhea alveolaris. The relatively high immunity to dental caries which made dental service so little needed was paralleled by the high resistance to infection in general and the splendid bodily development, thus reducing the urgency of medical assistance for even such problems as childbirth. I was advised that this was one of the least of their concerns.

It is of interest that a report of a physician[1] practicing on the island of his birth in the Shetland group just north of Scotland states as follows:

> During my 26½ years' practice here I have personally conducted over 1000 midwifery cases, normal and abnormal, and you will pardon an expression of the pride I feel in being able to say that I have never lost a single case. I have had cases of subsequent septic trouble, but all recovered. One case of acute peritonitis I nursed myself for a week, and brought her round.

This report is characteristic of the experiences in the Outer Hebrides. It is important to observe that these remarkable records are achieved in isolated districts without the safeguards provided by modern hospitalization, nursing care, prenatal instruction, oral hygiene lectures and demonstrations, and usually far out of reach from these modern necessities which have developed as an accompaniment to the degenerations associated with modern civilizations.

One cannot overestimate the good fortune of these isolated people that some factors, perhaps their primitive foods, have been capable of building so wonderful a defense against disease that they have been able to live comfortably and happily without these institutions and expert knowledge provided by modern scientific medicine and dentistry. If, then, one will picture these people plunged suddenly into a condition in which they had lost their high defense and have rapidly acquired the diseases of modern civilization without all of its facilities and opportunities for relief one can picture the tragic distress that overwhelms such a community when it has been blighted by the accompaniments of modern civilization which makes dental caries rampant and lowers defense for ordinary infections.

I reported the basic food factors in the different localities which provided immunity and for those where immunity to dental caries was lost. It was noted that the cereal used in the Alpine districts providing high immunity was chiefly rye, and in the Outer Hebrides chiefly oats, but that the entire cereal was used in each case and usually ground but never bolted. When those examined in the various communities are distributed on the basis of the type of cereal that constituted a part of the diet, those that used only entire cereal being placed in a column at the left and those who were using entire white flour breads at the right and in between intermediate groups using 25, 50 and 75 per cent respectively of white flour breads and the balance of entire cereal products and the other factors disregarded, important information is obtained. Before these data are reviewed it is important to note and to emphasize that the same transportation facilities that could bring in white flour and its products could also bring in marmalades, jams, and canned goods of various kinds to displace local products, and consequently, these can play an important part in producing the change that, unless we are careful to keep this fact in mind, may be ascribed too completely to the white flour products.

In Fig. 3 I have arranged those examined in all the different districts for whom I had fairly exact information as to the percentage of entire grain products and white flour products used in the nutrition on this basis. The number of cavities per person among those whose nutrition was characterized by the fact that they received only entire cereal products was only 0.3. When 75 per cent of the cereal was entire grain products and 25 per cent white flour breads this increased to 1.6 cavities per person; with equal parts of each 2.3 cavities per person and with 75 per cent white flour products and 25 per cent entire products this percentage rapidly increased to 5.3 cavities per person. In the group using

(Continued on page 277)

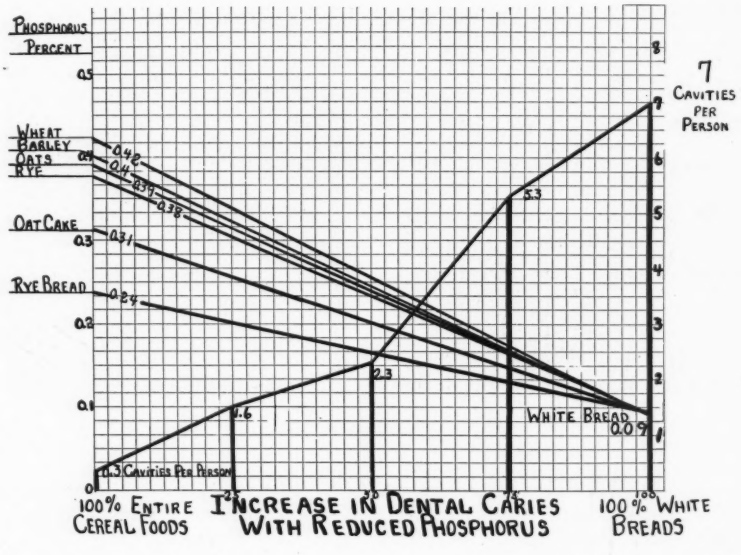


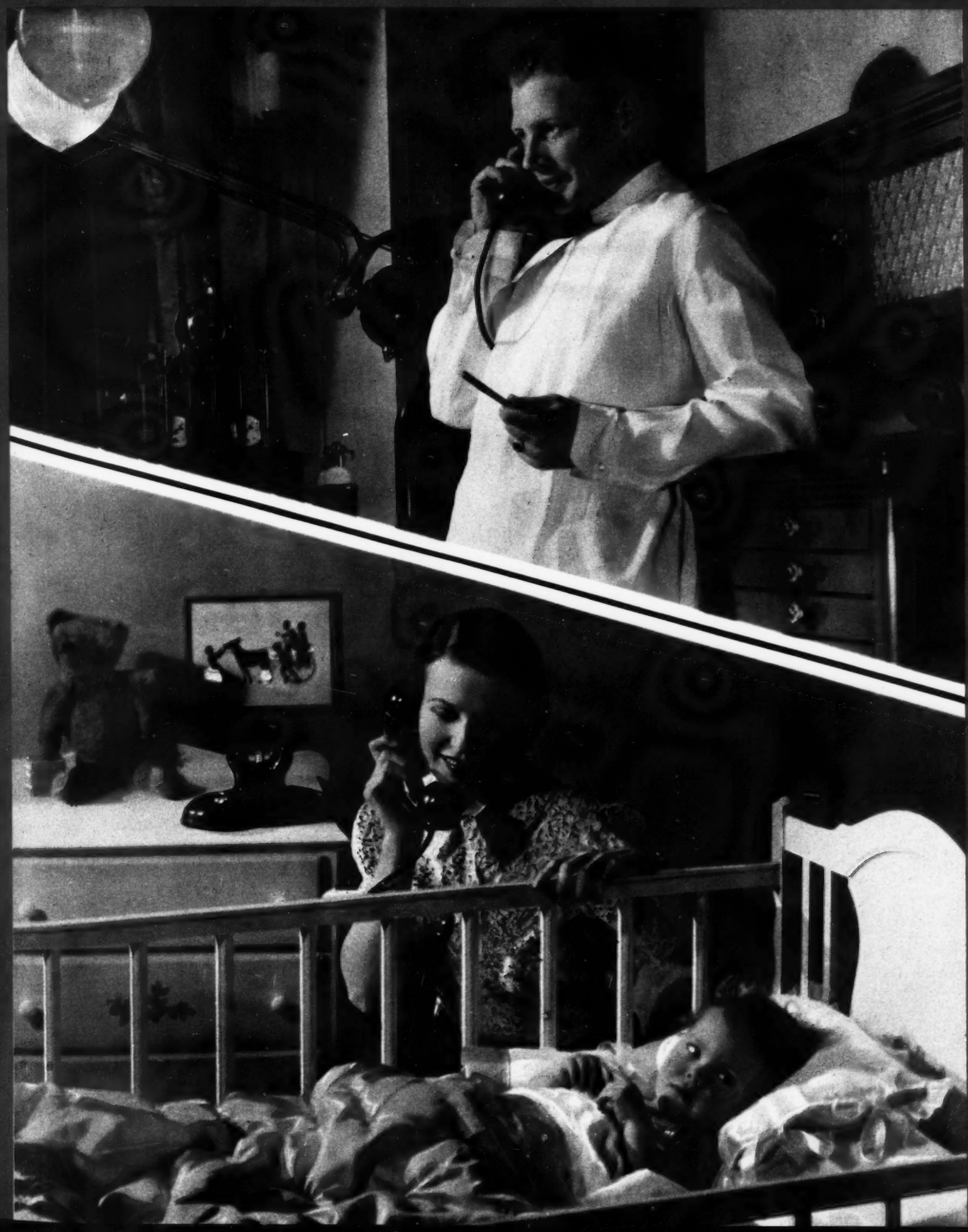
Fig. 3—Dental caries was found to be greatly increased in those persons who were using white breads and associated foods instead of whole grain breads. This increase was from 0.3 of a cavity per person to 7 cavities. Note the decrease in phosphorus content.

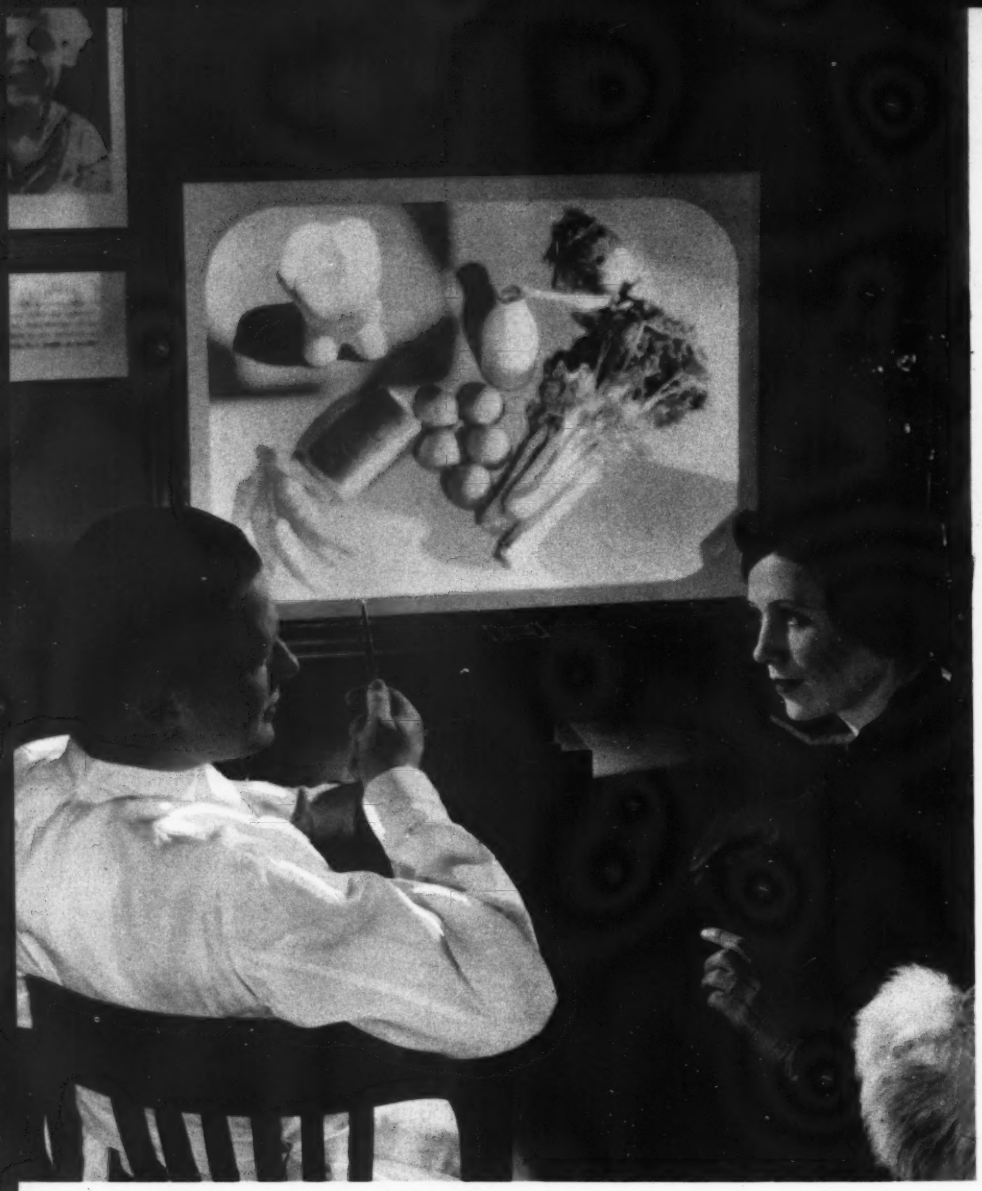
[1]MacKenzie, W. F.: Scottish Mothers and Children, 1917.

Ritter

COUNSELOR

VOLUME 1 No. 4 JULY 1933





Visual Education System Acclaimed by Dentists

WHO said that dentists closed their minds to progressive methods for building their practices?

Hard upon the announcement of Ritter's Visual Education System came a whirlwind response from dentists all over America—alert expressions of interest, earnest appeals for special consideration in the delivery of projectors and films—friendly words of commendation for Ritter's sponsorship of this new system of patient education . . .

Now that hundreds of dentists have had an opportunity to put visual education to the test of usage in their offices, comes enthusiastic acclaim for the system. Practically every mail brings its quota of letters testifying to the success which crowned its introduction in the writer's offices.

A New York Dentist writes:

"There is this that I like about this visual education system—it is not temperamental. A dentist gets tired of repeating the same story over and over again, at least I do and there are days when something may have gone wrong. Your visual story never loses its enthusiasm, never fails to present the truth in pictures and no matter how temperamental I might be that day, or my assistant or hygienist, it always is faithful and does the job. It has sold more dentistry for me in the last three weeks, and has sold it much more easily by convincing people of the value of a thorough radiographic service, than any other plan that I or anyone else could devise."

And another dentist says:

"I have called in some of my patients who have a mouth full of pathology, and who will not permit me to radiograph their mouths and have shown them the film without mentioning anything about the work that should be done. Then I tell the patient 'that is all.' Naturally, they are curious to know why I have proceeded thus. Then I explain that I have made a card record of the fact that I have done my duty to them as a patient of my office, and that if they should develop some physical ailment due to a poisoned blood stream from focal infection, I will be able to prove that I have done what I could to impress the patient with the importance of this matter."

The above dentist claims that he has called in a number of his obstinate patients who, after viewing the X-ray film, have consented to have the work done immediately.

Still another dentist writes:

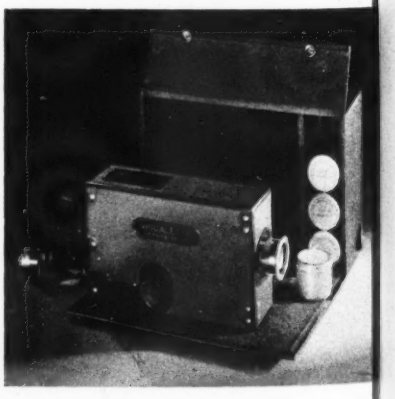
"To receive The Dental Digest this morning and read all about visual education and its possibilities was indeed extremely gratifying to me—I will now look forward to you for suggestions."

Does Visual Education Pay? . . . here is part of a letter that answers that question:

"I have shown that film to at least one hundred patients. The interest which patients have shown, the comments that they have made, and the increase in our X-ray work surely proves that it is an extremely good investment."

The Ritter Visual Education system embodies a Visualette Projector, with a series of films on four different subjects treating dental procedure in its relation to human health.

Complete literature on the Ritter Visual Education System, with descriptions of films, and prices, will be sent gladly, upon request. Do not delay—make your inquiry now.



Visualette Projector available in two sizes, for showing 35 m.m. "Still" film

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COUNSELOR
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VOLUME 1 *July, 1933* NUMBER 4

CHILDREN *Come First!*

—bringing the alert dentist a real opportunity to offset the decline in adult business.

DOCTOR JONES registered worry. Not a patient until eleven that morning. Anybody in his card index who might be ready for recall? He had checked over the entire file a week ago—but better do it again.

C. J. Backer—No use following him up. Once wealthy, now bankrupt. J. S. Barbon—He had money, too. Didn't someone say he was receiving relief from the Welfare? Too bad. Awfully decent fellow. Mrs. Dexter—She had dropped a cool million. Had lost her home. Hardly a profitable prospective patient for the immediate future.

Meticulously, he went through his entire record of patients . . . placing some cards in his closed files—dividing the balance in two neat piles. One became a skyscraper—the other a shamefully small stack. He snapped a rubber around the many; put them back into the file; thumbed disspiritedly through the little pack; got up and went to the window.

Next to the office building was a school yard. A class of youngsters was enjoying recess. He waved to two or three he knew. What a grand time they were having. No worries. Somehow, when things got tough, children seemed to suffer least. Fathers and mothers deprived themselves so that little stomachs could be filled, and little bodies adequately clothed. "The children come first!" That was parental attitude in a nutshell.

"The children come first!" The phrase beat like a pendulum in Dr. Jones' mind. He repeated it aloud, first softly—then with sudden exultation.

He went to the window again. One grinning youngster called to him. He raised the window. "Hey, Doctor . . . my mother's going to bring me down to see you soon as school's out next week. I gotta have a tooth filled, so she said all right soon as school's out next week."

That's fine, son. I'll be looking for you, son," said Dr. Jones happily . . . and to himself . . . "And, I'm going to build a new and bigger dental practice with the help of those boys and girls beginning right now.

And he is!

That episode, taken from actual experience, should make any ambitious dentist think — especially those whose practices have suffered through loss of adult patients. It illustrates an opportunity for aggressive development of a big practice . . . an opportunity that has been as remote in most dentist's minds as it was in Dr. Jones'.

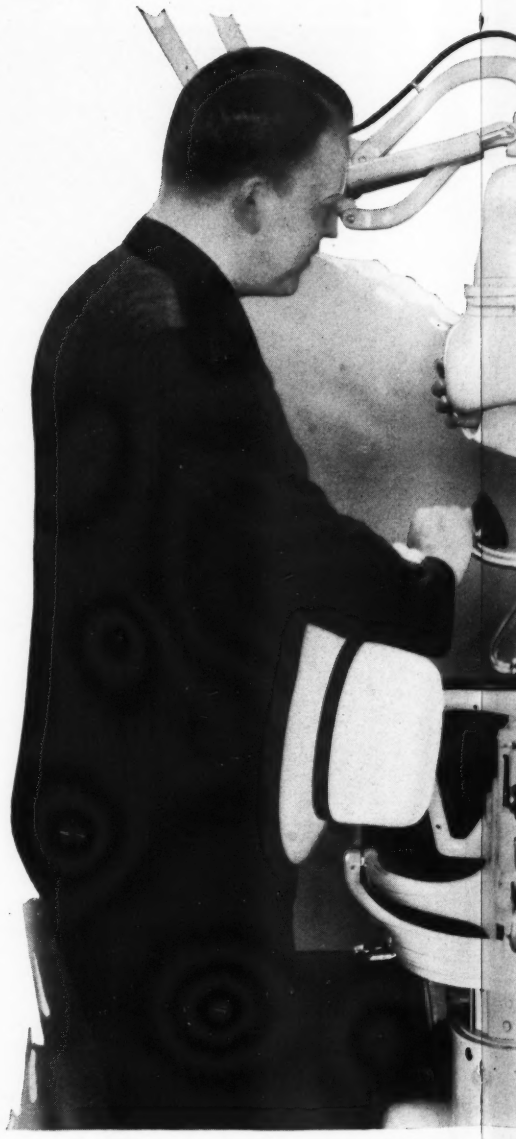
Possibly one of the most inexplicable and amazing conditions in dentistry has been the seeming indifference to the rich rewards to be garnered by a junior practice. Has this peculiar apathy toward a junior practice resulted from a delusion that attending the dental needs of children is a lowering of professional dignity? Is it some adult complex which renders children's work odious to the average dentist? Is it a dread of the strategic, diplomatic and psychological factors which must be mastered to successfully handle children?

Or has it been merely a lack of appreciation for the magnitude of the field of children's dentistry? *Certainly, it cannot be indifference to an opportunity that involves thirty million junior patients awaiting interested cultivation by the profession in America today, and the incomes to be derived therefrom* . . . not only immediate but for many years to come.

(Continued on page 6)

X-RAY YOUR WAY *to a* B

Doctor James presents the modern perspective on Radiographic Service.



DOCTOR RITCHIE skidded to a stop in front of Doctor Arthur James' attractive bungalow office just as a huge truck was pulling away.

"Now what did he buy?" wondered Ritchie as he entered the reception room.

"Say there, Art," he called. "Snap into it . . . Forest and Baker will be having the jitters . . . we're going to try to make eighteen holes . . . for Pete's sake what did you do . . . buy an X-ray?"

"Yep . . . let 'em wait . . . isn't it a beauty? . . . I'm turning this extra room into an X-ray diagnostic room . . . going to use the closet for developing."

"But Art, even though business is picking up a bit, migosh, you can't get enough X-ray work . . . I mean not enough people will pay for X-ray work to pay for that equipment."

"I've got the answer for that one," interrupted Dr. James. "But first let me show you this X-ray. Look! . . . did you ever see anything so perfectly balanced?" He swung out the extension arm, lowered the gleaming X-ray head down before an imaginary patient, "Look, Ritch, look at the way it positions; even at full extension it's as solid as a rock—nary a quiver!"

"As happy as a boy with a new bicycle," thought Dr. Ritchie. But in spite of himself the beautifully proportioned, compact apparatus excited his interest. There had been days when he too had considered the possibility of X-ray equipment . . . but since the depression . . . oh well, better not think about it! He reached over and gently touched the X-ray head. It moved silkily, easily, under the light guidance of his hand. He raised it; lowered it; turned it; then raised the projection-cone, and aimed it thoughtfully, at a point where a patient's impacted molar might have been. A slight buzz at his side told him an X-ray exposure was being made. He jerked his hands off the unit and jumped back. His face flushed a little . . .

"Say . . . you weren't shooting, with that thing in my hand?"

Doctor James grinned, "Certainly—and as a matter of fact, you could put your arms around it. See? Like this. No more danger . . . perhaps not even as much, as switching on that lamp over there. This job's safe, Ritch. See that head—all high tension apparatus is in there—transformer sealed in oil. Not a trace of current can escape. The tube is in the lower part, but because of its new design, they don't have to seal it in oil; it's in an air chamber, and that makes it easy to replace if ever necessary."

"Yes . . . that is better. But is it as efficient?" asked Dr. Ritchie.

"Considerably more efficient," answered Dr. James. "It's larger than the old type tubes, and has a much larger target surface. That has enabled them to get a more evenly distributed and more intense concentration of rays. Of course, that means increased penetration and better density and detail in bone and tissue conditions. I tell you, Ritch, you never saw anything to equal this unit in performance. Wait . . . sit down there . . . I'll take a few radiographs and show you . . ."

"Take a few radiographs!" exclaimed Dr. Ritchie reaching for his hat. "Do you realize we're holding up a couple of chaps who are dying to take a few shots at a golf ball? Tell me the rest on the way."

* * *

On the way to the golf course, Dr. Ritchie queried, "Now doctor, will you be good enough to tell me how you expect to get enough X-ray work to pay for that new equipment?"

"I'm going to X-ray every patient who comes into my office," answered Doctor James.

"Master mind!" said Dr. Ritchie. "And who is going to pay for all this X-ray work? Your patients won't . . . if they're anything like mine."

"Well, I'll tell you, Ritch; if the advertising dentist can build up his practice by making X-ray examinations gratis, then I figure I can do the same thing. You know I'm as strict an adherent to professional ethics as any man in town; but I sometimes wonder whether or not in some ways advertising dentists aren't destined to revolutionize our old ethical formulas. They advertise, yes; but then they expiate that sin by doing what every dentist knows should be done but doesn't do, unless the patient is able to stand the toll, and by that I mean an X-ray study of every case."

Dr. Ritchie looked disturbed. "Why Art, you're defending . . ."

"I'm defending nothing or nobody. I'm just stating the case honestly. You know just as well as I that to give conscientious service to your patients, every one of them should have X-ray diagnosis. You put off purchasing an X-ray because you d
patients will
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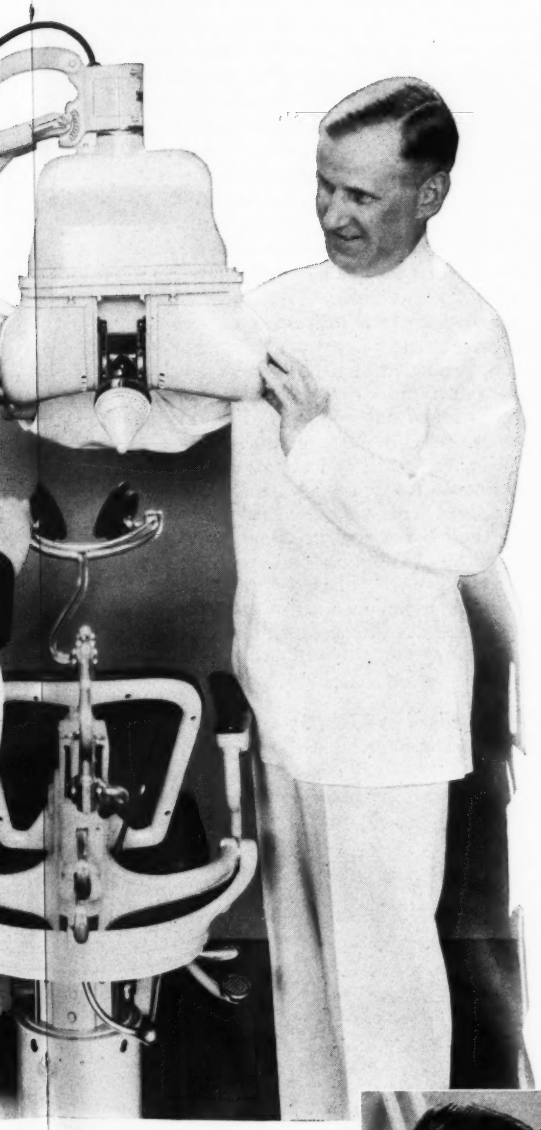
Bigger Practice...



ecause you don't believe enough of your atients will agree to the costs of radio-raphic examination to make it profitable . . and you ignore the fact that in not ilizing the X-ray you are evading a rious obligation to your patients. Now, ask you, would you call that strict ad-erence to high ethics?"

"Humpf!" grunted Dr. Ritchie. "What ould you have me do, operate a free -ray clinic? I guess not! One budding ltruist among us is enough!"

"I'm no altruist," grinned James. "That's a point I'm coming to. I'm going to make more money and have a bigger practice than I've ever had in my best years!"

"Congratulations. But go on, tell me, how you're planning to do it."

"All right, listen: Let's start with the premise that every patient should be X-rayed from the standpoint of reparative dentistry. Right? Very well, then; now here's another angle. Today, through the intensive public education work being done by big insurance companies, manufacturers of dentifrices, antiseptics, and in schools . . . preventive dentistry and its relation to personal appearance and health is becoming a more cogent topic all the time. You'll admit that, won't you?"

"Yes—you're right there; but I still don't see how you're going to reap such a big return on all the free X-ray work."

"Ritch . . . come out of the fog! The X-ray work I do is not going to be done free, any more than my other work is done free. It's a part of operative work that the patient must pay for—but it's not to be regarded merely as an extra operation, or an optional part of my dental service—it's going to be as definite a procedure as preparing a cavity."

"Well, it might work," said Dr. Ritchie. "But you're certainly blasting all the old conceptions of X-ray service, and how are you going to tell whether your investment in X-ray apparatus is paying?"

"How can you tell whether any part of your equipment is paying, except from the volume of work that you do?" answered Dr. Jones. "Listen, this ought to make the whole idea perfectly clear. I've purchased my X-ray unit as a capital investment. Just as I bought my sterilizer and chair. I don't exact a special fee from my patients for the privilege of sitting in the chair or because I sterilize my instruments. Nor do I charge a special fee for X-ray. I'm going to regard it as a part of the job and I'm going to encourage my patients to return periodically for X-ray surveys . . . and they're going to come, too, because service without the price tag takes the hardship out of the return call. Now, what's the result going to be? Certainly my patients will enjoy consistently better oral health—that's going to build me a reputation for reliable dentistry. Certainly they're going to be better satisfied with my work—more confident that every possible condition is being taken care of. But that's not all. How many times in your practice do you suppose you've missed work that should have been taken care of? I'd hate to have the interproximals I've missed marked down in the good-book against me. And I get a severe pain when I think of what those undiscovered conditions have meant in lost income, and lost patients too."

"Trouble with all of us who have been discounting the value of X-ray is that we've been looking at the proposition from the wrong perspective. We've regarded radiography as an optional service in the practice of dentistry, to be provided at extra cost when rendered, whereas rightfully it is as much a part of thorough, competent dentistry as local anesthesia. And used in that way, it can be made extremely profitable without the use of a specific, predecided fee."

Just then Dr. Ritchie pulled up in the Park Club yard and the conversation ended.

* * * * * * * *

"What's the trouble with your game, Ritchie?" asked one of the foursome in the shower room, "I never saw you dub so many shots."

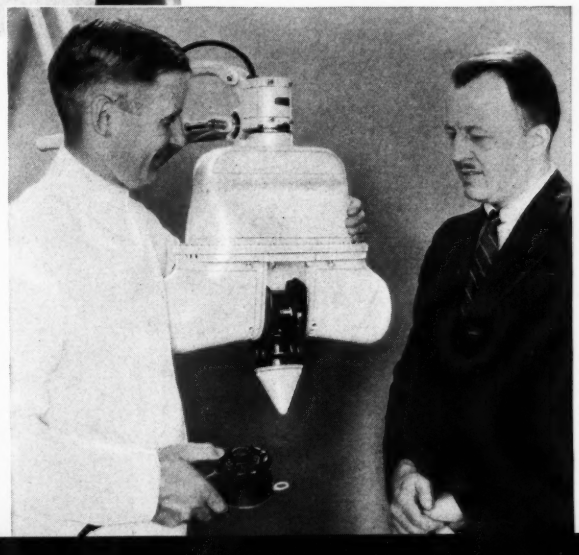
"He's been doing some shooting of a different kind this evening," said Dr. James.

"It's just a temporary lapse, due to heavy thinking."

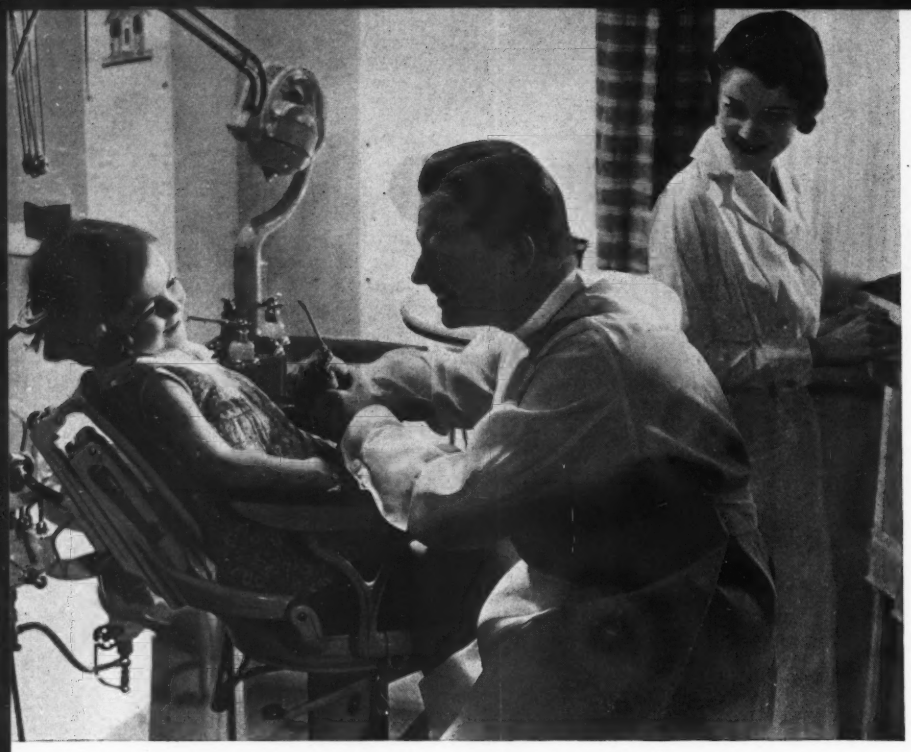
"Right," Dr. Ritchie chuckled; then added thoughtfully, "Listen, Art, I think I've become a convert to the New Idea."

* * * * * * * *

Note: The principle set forth in the preceding discussion, presents the most advanced and practical conception of the place of X-ray in dentistry. Ritter Dental Manufacturing Company, Inc., will be glad to amplify on any point of the article which may be obscure or subject to controversy. Also, complete literature on the New Ritter Model "B" Unit is ready for your request.



"So safe you could even put your arms around it during X-ray exposure."



Children's dentistry offers the dentist a timely opportunity to build a bigger practice.

(Continued from page 3)

A big percentage of the average dentist's practice is made up of people who came to him during the first few years of his practice. True, many of these patients send him other patients, but in most cases they are usually about the same age as the patients who sent them. This is but natural for people habitually associate with others of their own age. Consequently, as the dentist grows older, the age of his average patient becomes higher. There comes a time when most of them have seen their best productive years—have had practically all the dental work that can possibly be done—suffer reverses of fortune—move away—die—and in general become less profitable as patients than they were years ago.

The foresighted dentist will replace them by conscientiously cultivating his children's practice because the children of today are the men and women of tomorrow—the optimists of the future—the big potential earners coming into their best productive years—with mouths in which a minimum of dentistry has been done and which as years go on will require more.

The dentist who cultivates the right attitude toward children and keeps himself young by coming in contact with them in his daily practice has the best possible insurance against the disintegration of his practice.

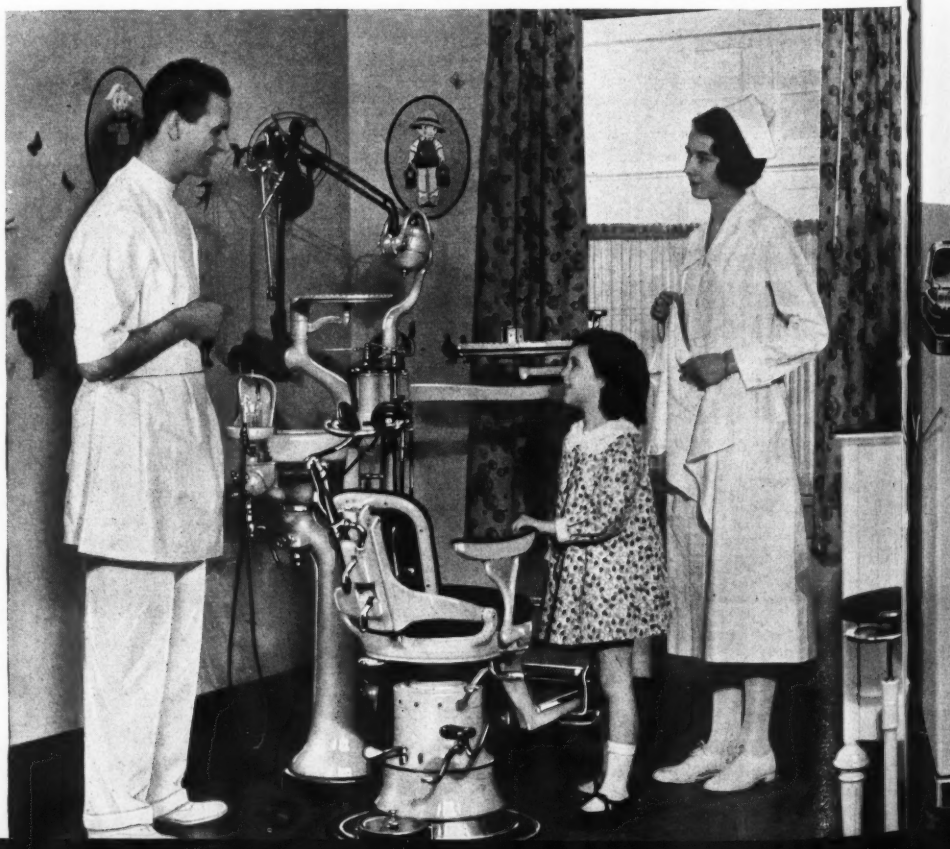
In your contemplation of the possibilities in children's dentistry, bear in mind that the children *do* come first and that with the reestablishment of family incomes the need for taking care of the children's teeth is a vulnerable point of attack with nine out of ten parents. They are being constantly urged by the school authorities, magazine articles and a movement of national magnitude and general publicity to guard the oral health of children; thus, what could be more natural than for the dentist to step into line and give his active support to the movement?

Unselfishly, the dentist may regard the promotion of children's dentistry as a contribution to the physical welfare of the nation. Selfishly, it means a lucrative practice . . . not only for today but for the future as well. It is an intensely interesting field of service, bringing to the dentist the naive and refreshing viewpoint of youth . . . in bright contrast to the sedateness of the mature mind.

School is out . . . and the youngster's vacation time is here. Appointments can be made in the cool of the morning. The tension and nervousness so often encountered when the child comes direct from school, are avoided. With ample time for play, there is no resentment for the encroachment on recreation hours, and most important of all, the active development of a junior practice at this time can be an important factor in offsetting the summer decline in adult practice.

How to reach and attract this junior business in a resultful, ethical way is explained with a comprehensive study of the entire subject, in the new Ritter booklet — "Winning and Holding the Child Patient." Those interested in developing a junior practice are urged to write for this discussion at once.

Children's confidence is most easily gained and kept by attractive equipment and surroundings.



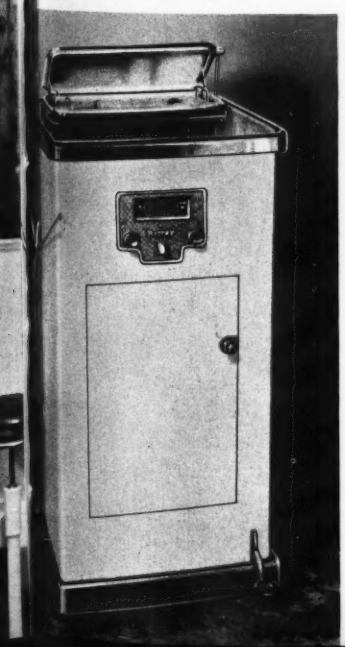
Dr. Roberts *Missed the Fade-out . . .*

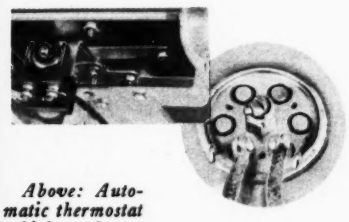
—then he bought the only low priced sterilizer that has both an automatic circuit breaker and an automatic thermostat.

THE glamorous foreign star and the handsome hero had found happiness at the end of the rainbow. But Dr. Roberts was not enjoying the picture. In the back of his mind he was asking himself over and over again: "Did I turn off my sterilizer or didn't I?" Finally the vision of his sterilizer being ruined through his own carelessness before he had had it two days was too much for him.

Clutching his hat, he crawled over neighboring knees and almost ran up the aisle. He did run when he reached the street; ran all the way to his office. He didn't wait for the night elevator but sprinted up the steps two at a time.

Outside his office door he sniffed hopefully. There was a smell of smoke . . . a sickening smell. His heart sank as he opened the door. Everything was quiet and dark. Snapping on the lights, Dr. Roberts went over to the sterilizer. Yes, the current was on!





Above: Automatic thermostat which reduces current when water starts boiling—cuts down your electric bill.

Right: Automatic Circuit Breaker—provides protection against damage to boiler and instruments should dentist forget to replenish water.

Gingerly he raised the cover of the sterilizer tank, burning his fingers in doing so. Naturally it was bone dry and fairly crackling from the heat. Would it work? Impatiently he waited until the tank cooled off a little and then poured in some water. There was a gust of steam that resembled Vesuvius in eruption . . . then more crackling and sputtering. Hopefully he turned on the switch . . . but there was no response. The heating element had burned out. The sterilizer was entirely out of commission. What a predicament to be in with tomorrow the busiest day of the week!

"Lucky I came in when I did," he thought, "No telling how much more damage could have been done. Why didn't I invest a little more and buy a Ritter Model 'B' Sterilizer? False economy, that is what it was . . . false economy."

* * *

Any dentist who buys a low priced sterilizer that does not have *both* an automatic circuit breaker and an automatic thermostat is not getting full value for his money. Heretofore these and other safety, convenience and economy features were obtainable only in higher priced sterilizers.

When the new Ritter Model "B" Sterilizer was introduced a few weeks ago it was enthusiastically received by the profession because it provides the most important features of the highest priced sterilizers, yet sells for very little more than the cheapest sterilizer you can buy.

The new Ritter Model "B" Sterilizer is the only low priced sterilizer that has both an automatic thermostat and an automatic circuit breaker. With its over-size heating element that covers the entire bottom of the sterilizer tank, the Model "B" quickly brings the water to the boiling point. The automatic thermostat reduces the current to the exact point required to keep it boiling. That saves current and prevents it from boiling over. The advantages of the automatic circuit breaker need not be elaborated upon here. Any dentist who wishes to avoid Dr. Robert's costly experience will not buy a sterilizer without one. In designing the new Ritter Model "B" Ritter engineers knew that some time you'll forget to shut it off—so they put on an automatic circuit breaker to do your remembering for you.

Now *that the Profession has sat in Judgment—*

FAR stronger than any advertising copy we could write—far more impressive and convincing than pages of involved description are these unsolicited tributes to the new Ritter Model "B" X-Ray Unit. They state the case for the new Model "B" concisely. They show what others who know X-ray think about this new X-ray unit. They invite your own consideration of this great forward step in X-ray Unit design. To examine and compare the Ritter Model "B" X-Ray Unit cannot fail to impress you too.

"The improvements incorporated in the New Model are a revelation: the flexibility in handling, the factor of safety, no exposed high voltage wires, and compactness, as well as the usual Ritter detail of construction, make it an ideal Unit. I honestly believe we are obtaining much finer detail in our radiographs with this New Model 'B' X-Ray Unit."

"The Ritter Company is to be highly complimented on the designing, perfecting and producing of this machine."

"It has more than come up to our expectations. I feel that the increased penetration possible with this outfit is extremely important."

"The Model B' X-Ray Unit represents a wonderful engineering feat . . . revolutionary in design."

"It is the finest thing we have ever seen or ever dreamed would be brought out."

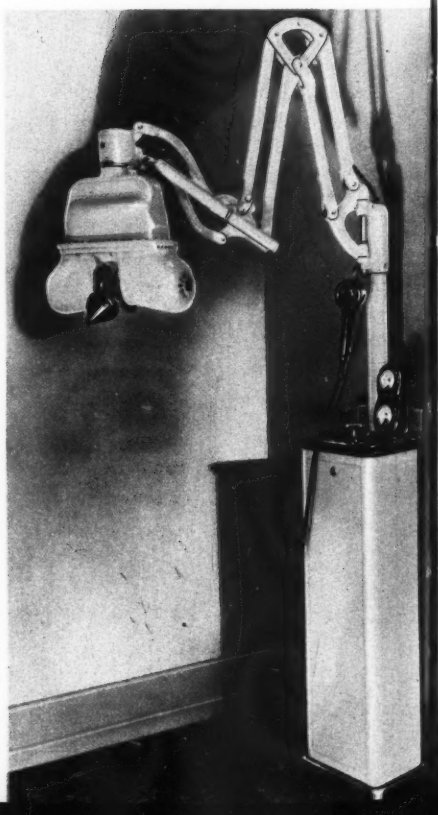
"Far above other appliances of similar type."

"The finest piece of equipment the Ritter Company has ever made."

"The improvements incorporated in the New Model 'B' are a revelation and make it an ideal unit. We are obtaining much finer detail in our radiographs with this new Model 'B' X-Ray Unit."**

**The letters from which these excerpts have been taken are in the files of the Ritter Dental Manufacturing Company, Inc.

Ritter Model "B" Dental X-Ray—wall t
requires only 10x14 inches floor space.



Ritter

Ritter Dental Manufacturing Co., Inc. **Rochester, N. Y.**

(Continued from page 268)

only white flour products this increases to seven cavities per person or twenty-one times as many cavities as in the group using entire grain products and associated primitive foods. When this change is related to the reduction in phosphorus on the basis of percentage in the cereal product used, the figures for which are shown to the left of the chart (Fig. 3), it is found that the fall is from 0.42 per cent to 0.09 per cent in the comparison of whole wheat with white bread. For barley the decrease is from 0.4; oats 0.39; rye 0.38; oat cake 0.31; rye bread 0.24 to 0.09 for white bread. While it is easy for those who defend white bread to assert that white breads should always be made with milk they must remember that the people in the Outer Hebrides have little milk available, and generally, none at all; since wheat does not grow satisfactorily as a crop, it is not feasible for the inhabitants of the Outer Hebrides to have freshly milled flour products because of their distance from the mills. It must be shipped in.

We arranged for a meal on the Isle of Bardsey where it was known that we were visitors and it was their privilege to prepare for their fee as fine a meal as might be possible. The meal consisted of white bread cut in large slices, already spread and stacked high on plates. This was to be eaten with a small piece of dried fish, tea, and canned orange marmalade. We were grateful for the privilege of obtaining refreshment since we had not taken the precaution to bring food with us. We were advised that this meal represented the staple nutrition of the people on the Island of Bardsey, and it was distressing to note that the two young ladies who waited on us, one probably a little under 20 and the other a little over, had lost a considerable number of their teeth including anterior teeth and had dental caries amounting to a serious deformity which destroyed the beauty of an otherwise comely face. One of these was a young mother and judging from the other children her child was doomed to a tragic handicap in the matter of nutrition.

What, then, were the factors in the nutrition of those groups free from dental caries which provided their safety? A clue was given in Fig. 3. Samples of typical foods were obtained in several communities and brought to my laboratories for chemical analysis. This included not only foods of human beings but the hay that was being stored for the winter feeding of the cattle in the Loetschental valley. The latter proved to be exceptionally high in the minerals, calcium and phosphorus, much higher than the average commercial hay as found in America.

In a previous communication I have outlined the procedure used in the Alps for harvesting the rye: It is cut with either a short or long handled sickle, usually the former, and the heads kept carefully together and stood in shocks to cure; then it is taken to the barn with the heads protected in large canvas wrappers, so that no seed would be lost, for it is precious. It is then shelled by hand by pounding on a special floor and the straw and chaff separated from the seed and the dry rye grain placed in special granaries which are built on stilts with large cap-stones over the stilt posts to prevent mice from obtaining access to the grain. We were told that rye is held as essential to the very life of the people. It has been so important and held so sacred that their name for the ladder leading up to the loft where the rye grain is kept is said to be called, when literally translated, "Stairway to Heaven." This rye is now largely ground for these primitive people in water-driven stone mills like those formerly hand-turned. The entire cereal content is used. I brought back with me from different places both the whole and ground rye for analysis. I have previously mentioned how each family has its rye ground in a community mill and how bread is baked from this in a community oven once a month. It was interesting to learn of the splendid keeping qualities of the bread.

In Fig. 4 will be seen a typical daily ration for people in the Alpine districts living on primitive foods on the basis of 2000 calories per day. For the growing children it was found that the major part of their nutrition is provided in the first three factors; namely, rye bread, milk and cheese. With approximately 800 calories for rye bread, and 400 calories for each of the other two, milk and cheese, the remaining 400 calories are made up in butter, barley, vegetables, and meat. The milk, cheese and butter as I have indicated were very high in fat-soluble activators and vitamins. The rapidly growing grass of the summer is dried and stored for winter use which makes possible a very high vitamin content in the dairy products during the winter season. I have expressed the fat-soluble vitamins in terms of low, medium, high and very high for all the products in this study. The minerals calcium, phosphorus and iron are shown in grams of the element for the quantities indicated. The total weight of each of the foods eaten is expressed both in grams and pounds. Accordingly, on a basis of 2000 calories a high food content of fat-soluble vitamins is received: 1.66 Gm. of calcium, 1.84 Gm. of phosphorus and 0.009 Gm. of iron in a total weight of 1349 Gm. or 2.9 pounds. Those who were hard working would increase and might even double this intake.

As the primitive foods were displaced with those of modern civilization the rye bread was largely exchanged for white bread which is much higher in calories per weight. Milk and cheese were reduced and jams, syrups, coffee and chocolate were added with meat and vegetables remaining practically the same except that more canned products were used. The cheese that should have been eaten was often sold to buy the new foods. This new ration is shown in Fig. 5 and, as indicated, it is seen that the fat-soluble vitamin intake was low; the calcium per day was reduced to approximately one-fourth or 0.44 per cent; the phosphorus to less than half, being 0.82, and the iron was not reduced but rather increased to 0.026. The total weight of the food decreased to 952 Gm. or 2.2 pounds. In other words, the people could now get their required amount of energy as expressed in calories by eating considerably less food. People all over the world enjoy this change.

Since our hunger sense applies almost exclusively to the energy producing factors and accordingly is satiated rapidly by those substances that are high in energy or calories, there lies herein one of the major factors in civilization's breakdown. In the primitive diet by the time the people had satisfied the calorie demand for energy factors they were compelled to ingest an adequate daily ration of minerals. It is as though we could buy either of two kinds of gasoline for an automobile: one that would give power only and another that while providing power, and perhaps a little less power, would make new tires grow as fast as the old ones were worn out, provide a new coat of paint and continually replace the old as it became weather-beaten, continually repair and replace broken and worn parts, and indeed make a little car grow into a bigger and better one. Who would not choose the better gasoline for the car? Yet modern civilization, partly through ignorance, selects the foods that will keep the body warm and furnish the power for the next few hours without con-

sideration for replacing worn tissues or building new and better organs and bodies.

Similarly a study of the nutrition of the people of the Outer Hebrides living on primitive foods reveals that oat products, such as oat meal porridge and oat cake, barley and fish products with a few eggs and occasional meat and vegetables constitute the usual diet. This typical daily ration is shown in Fig. 6. It provided with each 2000 calories a very high fat-soluble vitamin intake as supplied by the fish products and particularly by the baked cod's head stuffed with oatmeal and chopped cod liver. The daily calcium intake was 1.76 Gm; 3.04 Gm. phosphorus and 0.07 Gm. iron. This splendid supply of minerals is provided by 718 Gm. or 1.5 pounds. Hard working people would increase the total intake.

The modern diets of the group susceptible to caries in the Outer Hebrides is shown in Fig. 7. White flour products were substituted for the oat products; fish was greatly reduced, and jams, sugars and canned vegetables introduced. This does not mean that they do not occasionally have meat and fresh vegetables although the latter are limited largely to the summer season. This ration is very low in fat-soluble vitamins. It reduced the calcium to less than half, being 0.84; the phosphorus to about two-fifths or 1.3, and the iron remained about the same, 0.07. The total weight of the food increased from 1.5 pounds per day to 2.3 pounds.

Results of Chemical Analysis of Saliva

One hundred and seventy-one samples of saliva were secured from typical inhabitants in the various groups. These were obtained by having the subjects chew a piece of hard wax which was provided and then expectorate into a wide-mouth ounce bottle until it was three-fourths full of clear liquid. A sample was taken from this to inoculate a culture medium and then formalin was added sufficient in quantity to make a 1 per cent solution to control bacterial growth. No samples were lost. The procedure for analyzing was that developed by me[2].

Briefly the test consists of determining the inorganic phosphorus content of the saliva with and without the addition of powdered bone. In persons with high immunity to dental caries the behavior of the inorganic

[2]Price, W. A.: The Experimental Basis for a New Theory of Dental Caries, with Chemical Procedures for Determining Immunity and Susceptibility, Dental Cosmos, 74:1139 (December) 1932.

PRIMITIVE DIETS OF THOSE IMMUNE TO CARIES IN THE ALPS

Calories	Food	Fat-Sol. Vitamins	Ca	P	Fe	Weight Gms.	Weight Lbs.
800	Rye Bread	Low	0.07	0.46	0.0031	312	0.6
400	Milk	High	0.68	0.53	0.0014	576	1.3
400	Cheese	Very High	0.84	0.62	0.0012	92	0.2
100	Butter	Very High	0.002	0.002	0.00003	11	0.003
100	Barley	Low	0.005	0.03	0.0015	79	0.18
100	Vegetables	Low	0.06	0.08	0.0013	215	0.48
100	Meat	Medium	0.005	0.12	0.0009	64	0.14
2000		High	1.662	1.842	0.00943	1349	2.903

Fig. 4

MODERN DIETS OF THOSE SUSCEPTIBLE TO CARIES IN THE ALPS

Calories	Food	Fat-Sol. Vitamins	Ca	P	Fe	Weight Gms.	Weight Lbs.
1000	White Bread	Low	0.11	0.35	0.0035	377	0.8
400	Jam, Honey, Sugar and Syrup	Low	0.05	0.08	0.02	114	0.3
100	Chocolate and Coffee	Low	0.02	0.07	0.0004	16	0.1
100	Milk	High	0.17	0.13	0.0004	144	0.3
100	Canned Vegetables	Low	0.08	0.08	0.0013	215	0.5
100	Meat	Medium	0.01	0.11	0.0009	64	0.2
100	Vegetable Fats	Low	0.00	0.00	0.0000	11	0.003
100	Butter (Dairy)	High	0.002	0.002	0.00003	11	0.003
2000		Low	0.442	0.822	0.02653	952	2.206

Fig. 5

PRIMITIVE DIETS OF THOSE IMMUNE TO CARIES IN THE HEBRIDES

Calories	Food	Fat-Sol. Vitamins	Ca	P	Fe	Weight Gms.	Weight Lbs.
500	Oatmeal	Low	0.17	0.99	0.0096	252	0.5
500	Oatcake						
100	Barley	Low	0.003	0.31	0.001	79	0.2
800	Fish with Livers	Very High	1.54	1.62	0.06	320	0.7
100	Eggs	Medium	0.05	0.12	0.002	67	0.15
2000		Very High	1.763	3.04	0.0726	718	1.55

Fig. 6

MODERN DIETS OF THOSE SUSCEPTIBLE TO CARIES IN THE HEBRIDES

Calories	Food	Fat-Sol. Vitamins	Ca	P	Fe	Weight Gms.	Weight Lbs.
1000	White Bread	Low	0.11	0.35	0.035	377	0.8
400	Sugar, Jam, Syrup	Low	0.05	0.08	0.016	114	0.3
100	Chocolate and Coffee	Low	0.01	0.07	0.0004	16.5	0.03
300	Fish without Livers	High	0.57	0.60	0.02	120	0.26
100	Canned Vegetables	Low	0.06	0.08	0.001	215	0.84
100	Eggs	Medium	0.04	0.12	0.002	67	0.15
2000		Low	0.84	1.30	0.0744	909.5	2.38

Fig. 7

phosphorus is different from that which occurs in the saliva of persons with active tooth decay. In the types of saliva that maintain immunity the inorganic phosphorus lowers to approximately 30 or 40 per cent of the total amount by a process of adsorption onto the powdered bone; while in those cases with a marked tendency to dental caries the inorganic phosphorus is not only not decreased but may be definitely increased by a removal of inorganic phosphorus from the powdered bone. In the next communication (August, 1933) in this magazine I will present data indicating how readily an abnormal saliva can be changed to a normal one by reinforcing the diet in a way that will change the mineral and vitamin quantities from those characteristic of the groups living on modern diets to those which are characteristic of the diets of the groups who are immune to dental caries and live on primitive foods.

Since the vitamin levels of the foods tend, as I have shown, to be higher in the summer than in the winter and spring and since dental caries is generally more active in the late winter and early spring it would be expected that many of the children had had active caries because of nutrition that was below the minimum of safety during the winter season. At this time samples of saliva if obtained would have indicated a low factor of safety and would have changed during the favorable summer period to a sufficiently improved condition so that they would be experiencing at least a summer immunity. It was in this favorable season that I obtained the sample and while the condition was without doubt much less severe in the summer than it would have been had the samples been taken in the late winter and spring it is significant that the results of the chemical analyses as made for these groups checked in general with my findings for saliva taken from persons in my own clinic as well as from each of the two mission groups and a large number of specially selected patients of various dentists in many states and provinces who had severe cases of rampant dental caries. The results of these saliva tests are shown graphically in Fig. 8 in which will be seen as the fall below the base line the diminution of inorganic phosphorus of the saliva in the presence of powdered bone for the groups with a high immunity to dental caries. The average reduction in the immune groups which may be spoken of as the extent of the factor of safety is —1.9 per cent of the total inorganic

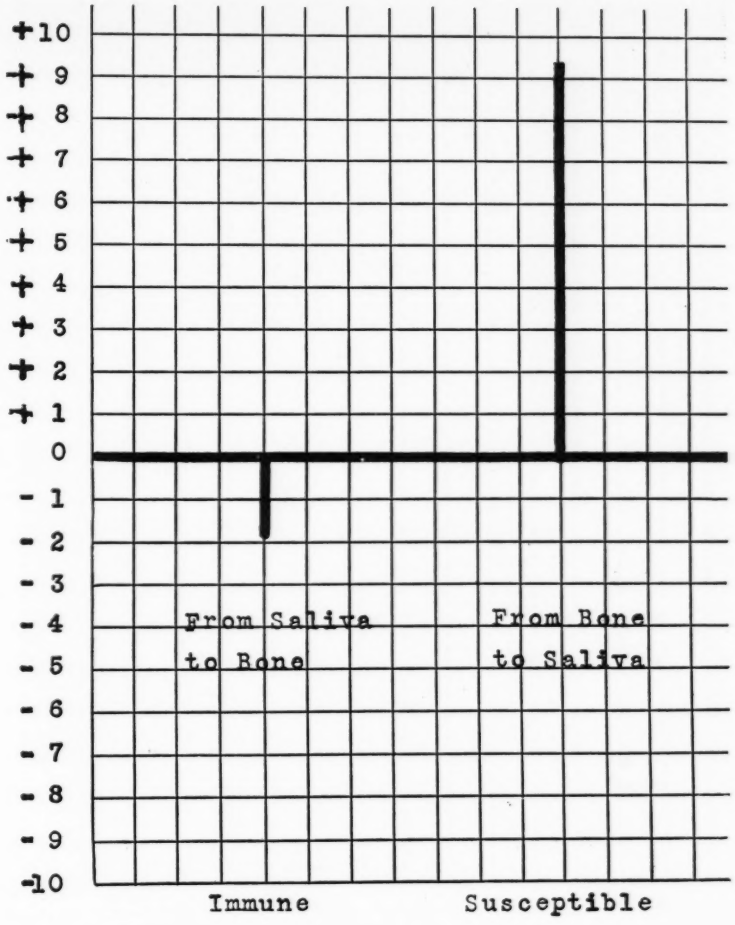


Fig. 8—As previously shown to be characteristic of the specimens of saliva of persons immune and susceptible to dental caries, the specimens of saliva gathered in these field studies, when averaged, showed that the inorganic phosphorus was reduced in the presence of powdered bone in the groups with high immunity and increased in those persons with active caries.

phosphorus of the saliva. For the groups with active dental caries the chemical analysis indicates that there not only was not the reduction characteristic of immunity producing saliva but there was an increase in this factor by the removal of phosphorus from the powdered bone to an amount equal to 9.4 per cent of the total inorganic phosphorus of the saliva.

While we are primarily concerned to throw light on the etiology of dental caries and means for its control, it is important that we study the general physical health of the people to note such evidence as may be available to reveal the relationship between dental caries as a nutritional problem and other degenerative processes resulting from the same causes. I have referred to the splendid physiques of the children as well as adults in whom a high immunity to dental caries existed. I wish to present an illustration of some readily observed physical characteristics of different groups. In Fig. 9 is seen a girl, aged 13, who lives in the central part of the Isle of Lewis whose unusually fine physical development is typical of large numbers of that community. The dental arches have a normal relationship and the teeth are free from dental caries. The uniformity of development has produced a splendid symmetry of the features and there is no tendency whatever to nasal obstruction or mouth breathing. This girl's nutrition has been strictly limited to primitive food.

In Fig. 10 is seen a girl, aged 11, who lives on the Isle of Skye, Airth of Sleat, in a community that ten years ago as reported had practically complete freedom from dental caries in all of the thirty-six children in the

Fig. 9—A typical girl in the central part of the Isle of Lewis. Here there is high immunity to dental caries and practically perfect dental arches. Note the splendid development of the middle third of the face.

school district. In this community as I reported in the last communication (June, 1933) in this magazine, a bakery and store have recently been established which supply modern foods. In a short time after its introduction its products are being provided to about half the inhabitants with the result that the population could be divided into two groups on this basis, those that are still on primitive diets have 0.7 per cent of the total number of teeth attacked by caries and those on modern diets have 16.3 per cent of the total number of teeth affected. In this figure the little girl's grandfather, aged 82, is also seen. He was carrying a heavy load of hay on his back when I asked him to permit me to take his picture with his granddaughter. It is important to note his splendid physical development and that he has retained his athletic frame. He has excellent teeth with no active caries. Mentally and physically he is equal to most men in modern civilization who are from twenty to thirty years younger. His granddaughter lives on modern foods and has active dental caries and marked evidence of disturbance in physical growth and is a mouth breather.

The next and last installment of this series of articles, in the August issue, will be a continuation of this discussion and will indicate the means by which adequately balanced nutritions provide immunity to dental caries and practical procedures for doing so. The marked difference in the incidence of the irregularities of the teeth and the significance of different types of facial deformities and their nutritional origin as found in the two groups will also be discussed. It is of significance that studies I have made of primitive groups in other countries, including the primitive people of America, and those that have been discussed are revealing the same fundamental factors as playing a controlling rôle in the etiology of dental caries.*

*A more detailed discussion and critical analysis of the data can only be presented in an extended text which has been prepared and to which these reports are complementary, and will shortly be available in book form.

(End of Fifth Installment)

Dental Research Laboratories
8926 Euclid Avenue.

Fig. 10—A typical girl from Airth of Sleat, Isle of Skye, and her grandfather. She has low immunity to dental caries, contracted nostrils and is a mouth breather. Her grandfather, aged 82, has excellent teeth.

The Editor's Page

THERE are eloquent signs in the land that the long-promised economic upswing has begun. Economists and statisticians who measure the economic health of the nation in terms of freight car loadings, steel orders, employment figures, electric power consumption, bank debits, are sending forth encouraging reports. The "man in the street," the common man, who thinks in terms of his job or his business or his profession, has begun to interpret the figures of the economists and has been given a new hope and a new courage. Throughout the country men are returning to work, factories are returning to production, money is beginning to circulate a little more freely. We are not yet out of the darkness, but light is beginning to show ahead. Pessimism is retreating; the day of sloganizing ourselves back to prosperity has ended. All signs are factual and point to recovery.

These facts give strong testimony: Steel, automobile, and textile production are increasing; the American Federation of Labor finds that jobs have been given to 1,200,000 men in the last two months; electric power consumption has been rising steadily since May 1; the Federal Reserve Board reports industrial production in May was 76 per cent of the 1923-1925 average used as a base; April, 67 per cent; March, 60 per cent; an increase in freight car loadings of 69,533 cars for the week ending June 17 above the corresponding week of 1932; an increase of 21 per cent in bank debits in the week ending June 21 above the corresponding week of 1932. This increase in bank debits is a reliable and sensitive gauge to indicate the improvement in money circulation. It can be expected that before long this fundamental improvement will be reflected in dental practice.

For those who need a renewal of faith in the future of the country, for those who thought or believed that we were on the verge of economic collapse, for those who thought that Western Civilization was in a true decline, we suggest a simple tonic—Attend A Century of Progress, the Chicago 1933 World's Fair. Here one will see tangible evidence of our facilities and resources, the moving drama of our scientific and industrial achievements, the solid foundations of American institutions.

A Century of Progress is no gaudy-tinseled carnival; no sentimental story of a past grandeur. The motif of the Fair is forward-looking; it is not reminiscent. The past is represented briefly to show our origins. The now, the present, is shown for us to appreciate our contemporary institutions. Just enough of the future is suggested to give us faith and an enthusiasm for tomorrow's possibilities and opportunities.

Adjectives and superlatives cannot describe A Century of Progress Exposition. The total effect—the architecture of the buildings, the color and lights, the man-made land that juts into the lake—might be called "stupendous." Some details—the side-shows, the barkers, the loud-speakers—might justly be called "blatant." There is interest and value for the fun-seeking and the knowledge-gathering. There is the Enchanted Island for the children; the Streets of Paris and the Belgian Village for those who look for "atmosphere," gondolas for the romantic, and power boats and thrill rides for the people who seek action. The Fair has been unfairly called by a few critics a hodge-podge. But a hodge-podge is a pudding made of many different ingredients. There is nothing of a pudding about the Fair. It is solid food. It represents the bone, the muscles, the sinews of American life. Here and there is a dash of "pastry" and light food: a bit of the country fair, a touch of the extravaganza of a circus. But fundamentally the Fair is solid. Man's conquest of disease, his harnessing of energies, his ingenuity and resourcefulness are dramatically represented. The Hall of Science alone is worthy of days of careful study.

Dentists who come to the Chicago Centennial Dental Congress should not plan to sandwich visits to the Fair between the scientific sessions of the Congress. A Century of Progress cannot be experienced that way. Both the Fair and the Congress are important. Neither should be slighted; neither should be subordinated. Dentists who wish to do complete justice to their families and themselves should plan to spend at least three or four days before or after the Congress in full attendance at the Fair.

CHICAGO CENTENNIAL DENTAL CONGRESS IN CONJUNCTION WITH A CENTURY OF PROGRESS EXPOSITION

Chicago Dental Society **American Dental Association**

Stevens Hotel

CALENDAR ABSTRACT OF THE OFFICIAL PROGRAM

AUGUST, 1933, A. M.

SUNDAY AUGUST 6	MONDAY AUGUST 7	TUESDAY AUGUST 8	WEDNESDAY AUGUST 9	THURSDAY AUGUST 10	FRIDAY AUGUST 11	SATURDAY AUGUST 12
	Exhibitors Demonstrations	General Session	General Session	General Session	General Session	Section Clinics
SPECIAL SESSIONS	Section I — Operative Dentistry, Mouth Hygiene, Prevention McKay (N.Y.) 11:00	Simpson (Mo.) 9:30 Souder (D.C.) 10:30	Maves (Ohio) 9:30 Noyes (Ill.) 10:30	Kelsey (Md.) 9:30 Byrnes (Ga.) 10:30	Hatton (Ill.) 9:30 Messner (D.C.) 10:30	General Clinics
	Sec. II—Full Denture Smith (Iowa) 11:00	Sec. I—O.D., M.H., P. Scholten (Iowa) 9:30 Gill (Calif.) 10:30	Clinics	Sec. I—O.D., M.H., P. Ray (Ill.) 9:30 Paffenbarger (D.C.) 9:45 Sweeney (D.C.) 9:45 Davis (Ill.) 10:30	Sec. I—O.D., M.H., P. Snyder (Ill.) 9:30 Tingley (Mass.) 10:30	Special Clinics
	Section III—Partial Dentures, Crown and Bridge, Ceramics Hinds (Texas) 11:00	Section II—F.D. Richey (Ill.) 9:30 Glupker (Ill.) 10:30		Section II—F.D. Stansbery (Cal.) 9:30 Jaffee (D.C.) 10:30	Section II—F.D. Farmer (N.Y.) 9:30 Lane (Mich.) 10:30	
	Section IV—Oral Surgery, Radiology, Anesthesia Lyons (Mich.) 11:00	Sec. III—P.D., C.B., C. Elliott (Texas) 9:30 Knapp (N.Y.) 10:30		Sec. III—P.D., C.B., C. Pilkington (Mich.) 9:30 Klaffenbach (Iowa) 10:30	Sec. III—P.D., C.B., C. Chappelle (N.Y.) 9:30 Krause (Wis.) 10:30	
	Section V—Orthodontia Weinberger (New York) 11:00	Section IV—O.S., R., A. Gardner (Minn.) 9:30 Waldron (Minn.) 10:30		Section IV—O.S., R., A. Aufderheide (Iowa) 9:30 Smith (Calif.) 10:30	Sec. IV—O.S., R., A. McKesson (O.) 9:30 Kazanjian (Mass.) 10:30	
	Section VI—Oral Pathology, Therapeutics Buckley (Cal.) 11:00	Section V—O. Johnson (Ky.) 9:30 Willett (Ill.) 10:30		Section V—O. Broadbent (O.) 9:30 Bach (Ohio) 10:30	Section V—O. Gromme (Ohio) 9:30 Brandhorst (Mo.) 10:30	
	Section VII—Biological, Sciences and Research Denton (Ill.) 11:00	Section VI—O.P., and T. Kirkland (Ala.) 9:30 Tishler (Mass.) 10:30		Sec. VI—O.P. and T. Walsh (N.J.) 9:30 Girardot (Mich.) 10:30	Sec. VI—O.P. and T. Walker (N.Y.) 9:30 Lundquist (Ill.) 10:30	
		Sec. VII—B.S. and R. Anderson (Conn.) 9:30 Pendleton (Ill.) 10:30		Sec. VII—B.S. and R. Tylman (Ill.) 9:30 Carlson (Ill.) 10:30	Sec. VII—B.S. and R. Fosdick (Ill.) 9:30 Hansen (Ill.) Borg (Ill.) Rosebury (N.Y.) 10:30	
	SPECIAL HOSPITAL CLINICS Schultz (Ill.) Tue. 10:00 Educational and Research Hospital Logan (Ill.) Tue. 2:00 Cook County Hospital Moorehead (Ill.) Wed. 10:00 Presbyterian Hospital Schaefer (Ill.) Thu. 10:00 Cook County Hospital Potts (Ill.) Fri. 10:00 St. Luke's Hospital			Special Session Rowlett (England) 9:30 Nord (Holland) 10:00 Brown (Ohio) 10:00		

Potts (Ill.) Fri. 10:00 St. Luke's Hospital

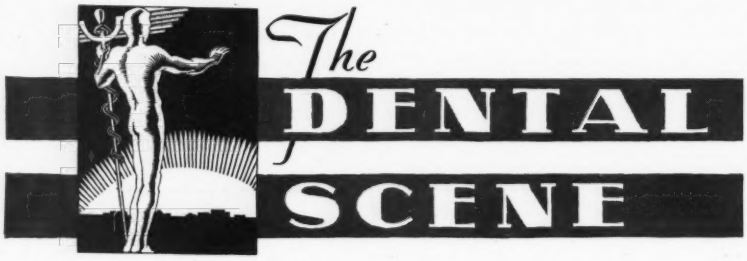
Brown (Ohio) 10:00

10:30

CALENDAR ABSTRACT OF THE OFFICIAL PROGRAM *(Continued)*

AUGUST, 1933, P. M.

SUNDAY AUGUST 6	MONDAY AUGUST 7	TUESDAY AUGUST 8	WEDNESDAY AUGUST 9	THURSDAY AUGUST 10	FRIDAY AUGUST 11	SATURDAY AUGUST 12
	General Session	**General Session**	**General Session**	**General Session**	**General Session**	
	Carr, Miller, Kelly, Dawes, Noyes, Buckley, Fisher, Black, Logan, Villain, Cumming, Pritchard, Dittmar	Schlosser (Ill.) 2:30 Hall (Ill.) 3:15 Rudolph (Minn.) 4:00	Johnson (Ill.) 2:30 Logan (Ill.) 3:15 Rounds (Mass.) 4:00	Hill (Ohio) 2:30 Lindsay (England) 3:15 Wandel (Ill.) 4:00	Millberry (Cal.) 2:30 Ryan (Ill.) 3:15 Rickert (Mich.) 4:00	
		Sec. I—O.D., M.H., P. Honoroff (Ill.) 2:30 Okumura (Japan) 3:15 Roberts (Ill.) 4:00	Sec. I—O.D., M.H., P. Wylie (Ohio) 2:30 Loughry (Ohio) 3:15 Hagan (Pa.) 4:00	Sec. I—O.D., M.H., P. Ferrier (Wash.) 2:30 Hartman (N.Y.) 3:15 Morgan (Wis.) 4:00	Sec. I—O.D., M.H., P. Willman (Ill.) 2:30 Baxter (Ill.) 3:15 Eyrich (Miss.) 4:00	
		Section II—F.D. O'Hare (Mo.) 2:30 Gillis (Ind.) 3:15 Tench (N.Y.) 4:00	Section II—F.D. Kingery (Mich.) 2:30 Crawford (Wis.) 3:15 Hight (Texas) 4:00	Section II—F.D. Hooper (Neb.) 2:30 Sears (N.Y.) 3:15 Taylor (N.J.) 4:00	Section II—F.D. Washburn (Minn.) 2:30 Luce (Germany) 3:15 Wright (Pa.) 4:00	
		Sec. III—P.D., C.B., C. Burgess (N.Y.) 2:30 Argue (Wash.) 3:15 Meyer (Minn.) 4:00	Section III—P.D., C.B. and C. Kesel and Stephan (Ill.) 2:30 Jones (Minn.) 3:15 Rinehart (Mo.) 4:00	Section III—P.D., C.B. and C. Roach (Ill.) 2:30 Oppice (Ill.) 3:15 Vehe (Minn.) 4:00	Section III—P.D., C.B. and C. Smith (Calif.) 2:30 Simpson (Va.) 3:15 Weaver (Ohio) 4:00	
		Sec. IV—O.S., R., A. Post (Ill.) 2:30 Silverman (Ga.) 3:15 Dunning (N.Y.) 4:00	Section IV — O.S., R., and A. Ennis (Pa.) 2:30 Goodfriend (Pa.) 3:15 Frew (Texas) 4:00	Section IV — O.S., R., and A. Lucas (Calif.) 2:30 Campbell (Mo.) 3:15 Blum (N.Y.) 4:00	Section IV — O.S., R., and A. Davis (Ill.) 2:30 Clark (Minn.) 3:15 Wahl (La.) 4:00	
		Section V—O. Brodie (Ill.) 2:30 Wright (Ind.) 3:15 Bradel (Va.) 4:00	Section V—O. Schour (Ill.) 2:30 Ham (Toronto) 3:15 Villain (France) 4:00	Section V—O. Krogman (Ohio) 2:30 Coulter (Ill.) 3:15 Corcoran (Ill.) 4:00	Section V—O. Lewis (Mich.) 2:30 Strang (Conn.) 3:15 Johnson (Ill.) 4:00	
		Sec. VI—O.P. and T. Merritt (N.Y.) 2:30 Hawkins (Cal.) 3:15 Jay (Mich.) 4:00	Section VI—O.P., T. Hess (Switzerland) 2:30 Beust (Ky.) 3:15 Grossman (Pa.) 4:00	Sec. VI—O.P. and T. Becks (Calif.) 2:30 Leigh (Neb.) 3:15 Hirschfeld (N.Y.) 4:00	Sec. VI—O.P. and T. Oliver (Ill.) 2:30 Fixott (Ore.) 3:15 Lake (Mass.) 4:00	
		Sec. VII—B.S. and R. Windle (Ill.) 2:30 Feiler (Germany) 3:15 Klein (Md.) 4:00	Section VII—B.S., R. Smith (Ariz.) 2:30 Arnold (Ill.) 3:15 Bachem (Ill.) 4:00	Sec. VII—B.S. and R. MacMillan (Ohio) 2:30 Visscher (Ill.) 3:15 Fink (Ill.) 4:00	Sec. VII—B.S. and R. Kronfeld (Austria) 2:30 Chase (Ohio) 3:15 Stuteville (Ill.) 4:00	
		General Session 7:30 Carey (Ill.) Haggard (Conn.)				



SCIENCE is on parade. Its march is a tune of defiant color; lights are its banners; progress is its promise.

It would be as useless as it is undesirable to expect visiting dentists to A Century of Progress Exposition to be interested only in the scientific exhibits as such. To be sure, these have an intrinsic, justifiable place and compelling attraction, and will, through motivations of professional duty or scholarly urge, be examined with varying degrees of care or casualness and remembered with proportionate accuracy. It is more likely that the end-products of science, epitomized in the kaleidoscopic vastness and minuteness of Chicago's second World's Fair, will command the greater attention. And perhaps this is as it should be. But "should" will have nothing to do with it if your reactions run true to form. With the firmest resolve to spend all of your first day at the Fair in the Hall of Science, you will find yourself moving on and on, arrested by sounds, attracted by lights, and always delighted though foot-sore.

You will see the Incubator Babies, consciously, as an achievement of science, but emotionally with that characteristic parental chuckle. If you have ever been to Brussels your heart will leap up with joyous reminders—even to the cobblestones and their effect—when you enter the Belgian Village. If you have never been, you will know that you want to go some day as you watch the native artisans at work in etching-like courtyards and as you wander from cathedral to café and back to the little temple where "The Crucifixion and Transfiguration of Christ" is displayed for you. You will know that you will want want to see the painting in which "The Saviour Opens His Eyes Before the World" again some day after the Fair when you go to Brussels—a seeming miracle explained in terms of genius with the aid of oil paints and lights.

If you have been to Paris, the Streets of Paris, undoubtedly will not ring true, as does the Belgian Village; and if you haven't been to Paris it is only fair to warn you not to be misled. The Belgian Village is a serious and remarkably successful attempt at reproduction. It captures something essential which is more than atmosphere. The Streets of Paris was done with tongue-in-cheek, but it is a gay place withal. Certain typical characteristics, which Americans abroad always write home about, have been reconstructed with stage-setting effects and without regard for the geographic juxtaposition of the original features. But what matter, why be critical if the Café de la Paix is placed opposite the Dôme and separated merely by a swimming pool instead of boulevards running through several quarters of the city? You probably won't see beaver-collared be-monocled men, and women with mammoth paste diamonds at the Café de la Paix, but the Dôme in the Streets of Paris where you will drink your 3.2% phosphate Burgundy (which is quite palatable) at outdoor tables *comme propre* may prove to be another "cross-roads of the world" as is the Dôme in Montparnasse. And if you know any French at all, be sure to read the writing on the wall. You will find therein a laugh or two.

Should you find yourself near the south end of the Fair Grounds any time between 7 and 10 P. M., near a sign reading "Wings of a Century," and should you hear train whistles blowing nostalgia into your veins, you would do well to go in and investigate, and you may *sit* while doing so. (The importance of the latter you will realize better at that time.) "Wings of a Century" has been called by critical observers the best show at the Fair, though those who wish to check this statement will have ample opportunities to do so in the carnival section with its Cyclone thrill ride and side-show barkers, or in fortune-telling Morocco. Or, if you have ever had a yen to examine a submarine, the soon-to-be demobilized craft on exhibition will prove a satisfying contender.

Along about midnight when all things educational, electrical, historical, horticultural, industrial, cinematic, scientific, religious, architectural, aquatic, atmospheric, picturesque, culinary, romantic, and wistful have been imbibed, and you are feeling on the borderline between the esthetic and bald, there is still Old Mexico down on Thirty-Ninth Street—just a night club—beer, floor show (where gilt and fans are used in costuming), and dancing, if weary feet will.

It is a strange but delightful experience this Fair. One strives to describe it by comparisons with previous experiences, but it defies comparisons, because just as one says, "I know what it reminds me of—an afternoon in the Prater in Vienna," another reaction calls up a night of revelry on board ship, another a recollection of a childhood dainty, and a fourth, a school field trip, and a fifth, a country fair or maybe Alice in Wonderland. It is at once distinctive and conglomerate, a unity and a composite—a unity of design and scheme with variety of interest.

A Century of Progress Exposition is a festive playground, teeming with life and light and pleasantry, where differences drift in leisure, unannoyed and unannoying, thrilled by the exquisite commingling of colorful and multiform achievements.

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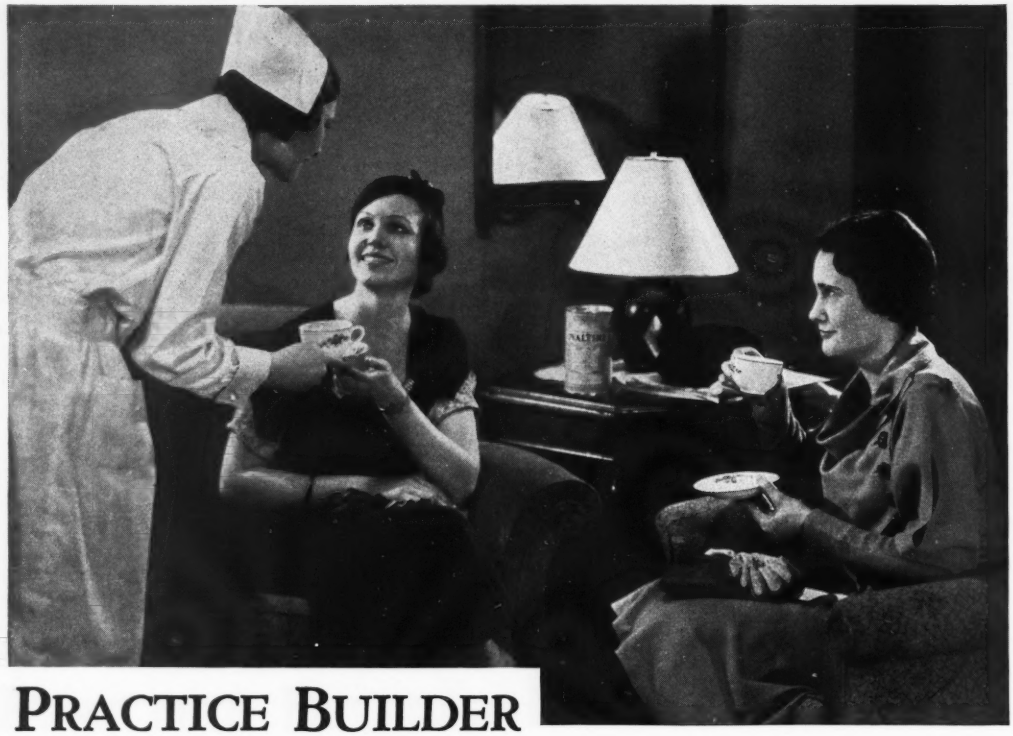

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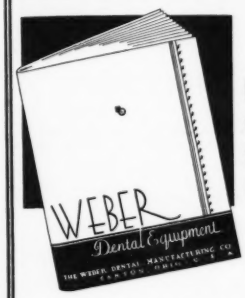

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ABOUT OUR CONTRIBUTORS

LEONARD S. FLETCHER received his D.D.S. in 1924 at the University of Pittsburgh. Doctor Fletcher is a member of the A. D. A., Odontological Society, South Hills Dental Society, Pittsburgh Dental Society, and the Old Lake Erie Dental Society. Doctor Fletcher has a general practice at Poplar and Pine Streets, Castle Shannon, Pennsylvania.

The biographies of WILTON W. COGSWELL, D.D.S., F.A.C.D.; C. J. STANSBERY, D.D.S.; and WESTON A. PRICE, D.D.S., M.S., F.A.C.D., appeared in previous issues of THE DENTAL DIGEST.

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2 Dozen Package	1.55	1.40	1.10
A— One film per packet			
1 Gross Dispenser Package	7.20	6.55	5.00
½ Gross Package	3.65	3.30	2.60
2 Dozen Package	1.25	1.15	.90
Radia-Tized, *No. 0-size (⅞" x 1⅜")*			
			Nitrate
0-AD—Two films per packet			
2 Dozen Package		1.40	1.10
C and CC Types, *Standard-size*			
C *Regular*, CC *Extra-Fast*—Two films per packet			
1 Gross Package		8.00	6.00
½ Gross Package		4.10	3.10
1 Dozen Package		.70	.60

EASTMAN OCCLUSAL DENTAL X-RAY FILMS (2¼" x 3")

	Nitrate	
Super Speed, 1 dozen Package (2 films per packet)	$2.45	$2.00
Regular, 1 dozen Package (2 films per packet)	2.45	2.00

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"It Tastes So Good . ."

FROM A LETTER WRITTEN BY A VYDON DENTURE PATIENT

In an unsolicited letter the wearer of a full Vydon denture describes in part her satisfaction with Vydon in these words . . . "It tastes so good."

What she means, of course, and the reason she is satisfied is that Vydon does not have the disagreeable taste of her former denture. Therefore it seems to have a pleasant taste whereas it actually has none.

Vydon is not only tasteless when new but being chemically inert, dense and impervious to oral fluids it never acquires either a taste or an odor.

No wearer would write us in praise of Vydon if only the taste were pleasant. Such letters indicate that Vydon is also all that we claim it to be in other respects . . . comfortable, clean, non-irritating, natural in appearance and possessing a thermal conductivity which permits normal mouth sensations. To assure utmost satisfaction for your denture patients recommend this superior new material.

VYDON

A Lee Smith Product

This Dentist is a General Practitioner

Unless you have attended one of Doctor Cogswell's clinics, you cannot fully appreciate the value of his unique technique. The wax models which he uses at the various dental meetings are the most accurate and life-like reproductions of actual mouth conditions dentistry has ever known. The enthusiasm and inquiries which his clinics created really prompted him to publish DENTAL ORAL SURGERY. Each month more and more dentists are realizing the importance of his book and are profiting from it by purchasing copies in order that they may completely master the Cogswell technique. The fact that DENTAL ORAL SURGERY has already been accepted as a standard textbook by several large universities is proof of its practicality.

The price of DENTAL ORAL SURGERY is only $10.00. The coupon on page 292 is for your convenience. Clip it and mail today.

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This Dentist is a Specialist

FACTS ABOUT THE NEW CLEANSING AND POLISHING AGENT IN PEPSODENT TOOTH PASTE

Removes Mucin Plaque ... retards its formation

Pepsodent does double duty in combating film!

1

It stands unsurpassed in safely removing film deposits.

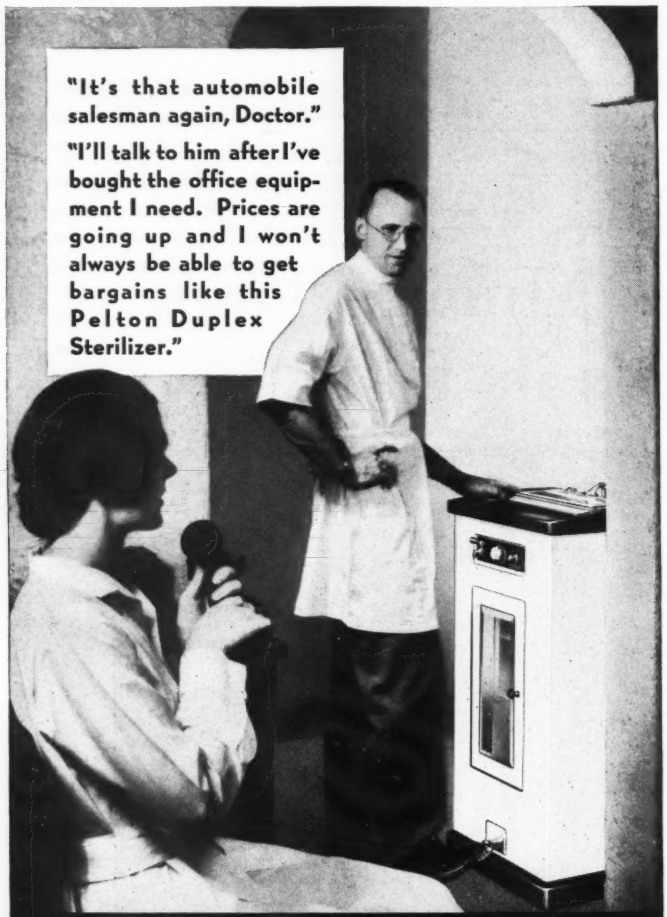
2

By giving higher polish to enamel, film adheres far less readily.

Teeth stained with disclosing solution. Note excessive amounts of mucin film

The same teeth stained a second time after brushing with Pepsodent Tooth Paste

Pepsodent . . . *special film-removing tooth paste*


"It's that automobile salesman again, Doctor."
"I'll talk to him after I've bought the office equipment I need. Prices are going up and I won't always be able to get bargains like this Pelton Duplex Sterilizer."

He's right—the famous Pelton Duplex, with 14-inch sterilizer, sells today at $92.00. Other Pelton Equipment is also still available at low prices. Right now you can save many dollars on new, modern equipment—an investment in your own business which will pay regular dividends in the years to come. See your dealer at once!

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A More Effective Dollar's Worth!

Buffalo Dental Prophylaxis Paste

Buffalo Flour of Pumice is skilfully blended in this paste cleaner to do a prophylaxis in a most economical manner.

Patients comment on its delicate flavor, while operators everywhere prefer it to other cleaning agents because it comes ready mixed, holds its consistency, and is easily controlled in use.

And the beautiful, modern Buffalo Dental Prophylaxis Paste jar, adds an attractive touch to your cabinet or instrument table.

Only a dollar, and every regular dental dealer carries it in stock.

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THE DENTAL DIGEST
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Will you try a thorough and gentle means of

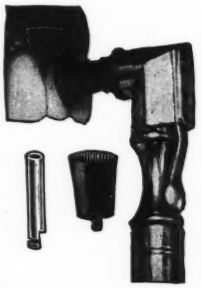
CLEANING AND POLISHING TEETH?

ASK US FOR YOUR SAMPLE

TRADE BS MARK POLISHERS
PATENT NO. 1277020

FOR prophylaxis which will clean the necks of the teeth, under the free margin of the gums, and much of the proximal surfaces, use BS Polishers with Young's Mandrels in an angle handpiece. There is no laceration of the soft tissues or scratching of the teeth. Every tooth is easily accessible with these short mandrels and the handpiece is fully protected without any cumbersome or annoying extra bulk in the mouth.

Use these polishers according to directions and see if you do not agree with the many dentists who have never found anything equal to BS Polishers for thoroughness in cleaning and gentleness to patients.

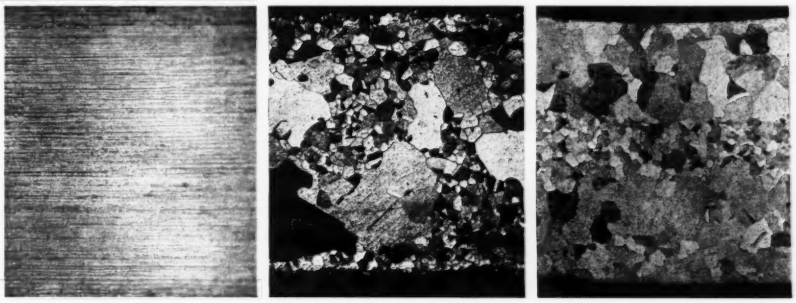


USE COUPON ON PAGE 292

YOUNG DENTAL MFG. CO.
4958 Suburban R. W., St. Louis, Mo.

DANGERS OF OVERHEATING

Breakages of clasps, stress-breakers, bars and orthodontic or other appliances (either cast or made of wrought wire or plate), often result from overheating.



Left: *Longitudinal section showing fibrous structure of normal wire.* Center: *Medium fusing wire made coarse grained and brittle by heating at 1500°F. for 1 hour.* Right: *Broken 18 ga. wire clasp injured by overheating during abusive soldering.*

Cause: Injury from overheating may result from carrying the work to too high a temperature for a very short time or from holding it at a moderately high temperature for a long time. Heating to too high a temperature may occur if care is not taken in annealing over a flame, or in soldering, especially if a sharp intense flame is used. Thin parts heat rapidly and are especially susceptible to this type of injury. Holding at high temperatures for an excessively long time often occurs in heating invested work preparatory to soldering or in the "casting against metal" technique. Such work should not be left on the fire longer than is absolutely necessary.

Effect: Overheating is often very injurious to metal which is not even partially melted. It causes grain growth, making the metal coarser-grained. Metal is usually weaker and more brittle in a coarse-grained than in a fine-grained condition. Practical experience and laboratory tests have shown this to be true of many dental gold alloys, especially if they are subsequently subjected to a hardening heat treatment or allowed to cool slowly in the investment. Invested work held at high temperatures for a long time is also subject to the danger of excessive oxidation and possibly to attack by some constituent of the investment, perhaps sulphur, or a sulphur compound from the plaster.

Avoid heating work hotter than necessary.
Avoid holding work at a high temperature longer than necessary.

THE J. M. NEY COMPANY

HARTFORD, CONN. CHICAGO, ILL.

Inquiries on this or any other metallurgical problem will receive our prompt and careful attention.

Coupons

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Please send me, without charge, some samples of OVALTINE for distribution to my patients. Evidence of my professional standing is enclosed.

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Wilson's CO-RE-GA is Used and Prescribed very extensively by full denture prosthetists. Holds Dentures Firmly and Comfortably in Place while your Patients are Learning to Wear them . . . . . .
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GENERAL ELECTRIC X-RAY CORP.
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THE DENTISTS' SUPPLY COMPANY
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Please send booklet mentioned in your advertisement.

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ASSURANCE

within arm's reach

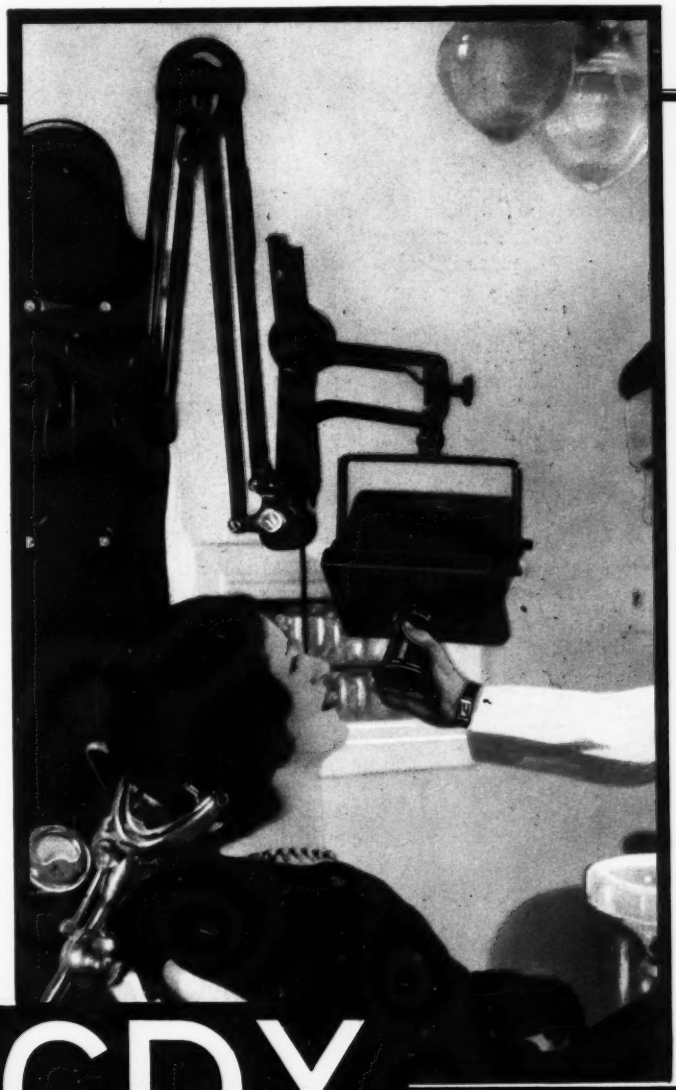
THE CDX is a flexible x-ray unit, always available within arm's reach at the position in which all dental x-ray work is done—in the dental chair.

CDX equipment is exceptionally compact and conveniently arranged. It may be attached to a wall panel or mounted on a mobile cabinet. In either case it makes an attractive addition to your operating equipment. It conserves valuable floor space and is always available for use with simplicity and assurance.

The matter of price cannot be the major consideration when selecting a piece of equipment like an x-ray machine. Safety and efficiency are of far greater importance.

In the CDX x-ray machine you will find the most advanced requirements for safety and efficiency. It is an all-purpose dental machine that is suited to the needs of general practitioner and the man who specializes alike. Its simplicity of operation makes it adaptable to any office or practice and its safety is a source of satisfaction to the user.

The CDX is backed by years of scientific research and the resources of a concern that has specialized in this type of equipment for many years. Information may be had from dealers everywhere or you may send the coupon on page 292 for interesting and instructive literature. We would like to tell you about our convenient installment payment plan which enables the equipment to pay for itself while you are obtaining the benefits from it.



SAFETY

All high tension parts, including the Coolidge tube, are located in the head and immersed in oil. No exposed contacts. No high tension wires overhead to guard against. This construction makes the CDX 100% electrically safe, and protects operating parts from weather, temperature, and dust.

EFFICIENCY

The CDX is designed for all kinds of dental work, both intra-oral and extra-oral. The head is easily and quickly adjusted to any operating position. No complicated controls. Years of scientific improvement have made it possible to obtain clear-cut, definite detail in roentgenograms. Only a CDX has CDX efficiency.

COMPACTNESS

The CDX wall type is designed to occupy a minimum of office space. It can be attached to the wall with or without the wood panel. It requires no floor space. No office is too small to accommodate a CDX. No office is too large to use one efficiently.

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X-RAY CORPORATION
2012 Jackson Boulevard Chicago, Ill., U.S.A.
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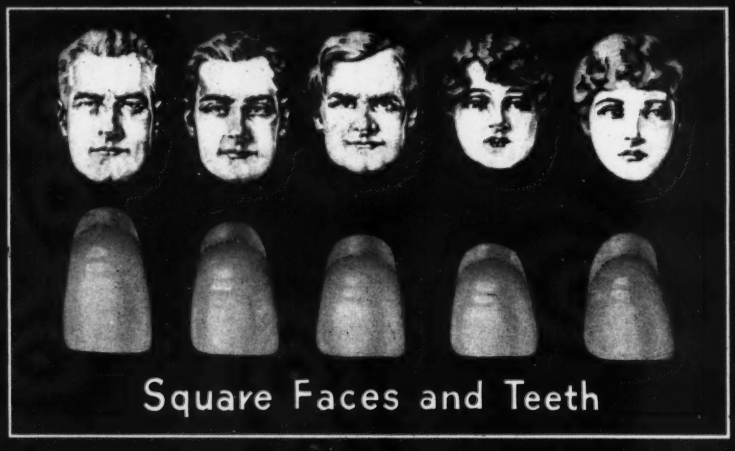
X-RAY **CDX** EQUIPMENT

NEW TRUBYTE WALL CHAR

Send Now for your Copy showing NEW TRUBYTE Forms and Sizes

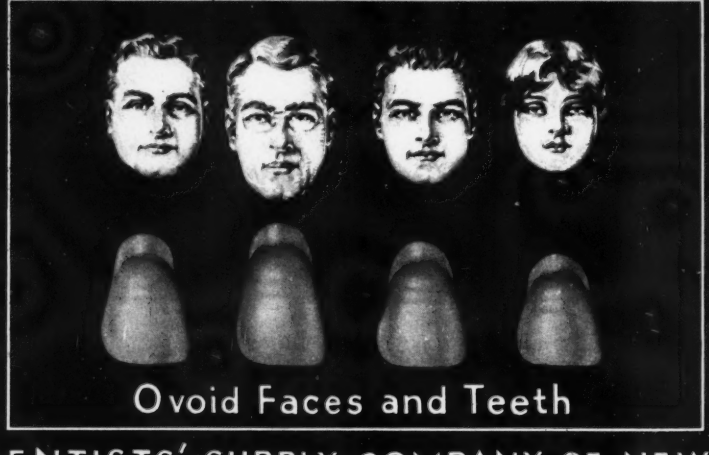
NEW TRUBYTE TEETH AND RELATED FACE FORMS

(FOR DIMENSIONS, SEE OTHER SIDE)



Square Faces and Teeth

Tapering Faces and Teeth



Ovoid Faces and Teeth

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